THE RAILWAY GAZETTE

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Coal and Mineral Traffics

BRITISH Railways coal class traffic receipts continue at a low level, revealing a trend which is being taken into account in re-considering the modernisation plan. For the 12th four-week period of the year, that ended on November 30, receipts at £9,359,000 were 16·4 per cent below the corresponding figure for 1957. In view of what appears to be a permanent diminution in coal consumption by industry and domestic consumers, and, in due course, as steam traction disappears, by the railways, the whole subject of coal movement is being re-examined. A revival in industry may result in some increase in movement, but when present stocks have been drawn on, which presumably entails increased despatches by rail for a period, a permanently lower level of traffic may be expected. An important consideration is the future increase in consumption of atomically generated electricity. In view of the large proportion of railway revenue hitherto derived from coal traffic, the matter is serious. The outlook for mineral traffic is better. Steel production in the United Kingdom has now levelled off at a rate some 16 per cent below last year. Output last month was at a weekly rate of 351,900 tons, compared with 363,500 tons in October and 429,200 in November last year. This is reflected in British Railways receipts for the 12th period, which are 16·8 per cent below last year's figure. There is, however, a general feeling in the industry that business has now touched bottom, though it may be many months before recovery manifests itself. It is believed in some sections of the industry that the de-stocking movement of the third quarter is now coming to an end. Figures released by the Iron & Steel Board recently show that consumers' and merchants' stocks of finished steel dropped by about 6 per cent in the quarter, the biggest fall ever recorded in the industry. There are, moreover, indications of improvement in a revival of despatches by rail from some districts of firebricks and other articles and substances used in the manufacture of steel.

The Late Mr. Edwin C. Cox

THE 53 years' railway service of Mr. Edwin Cox, former Traffic Manager of the Southern Railway, whose death is recorded elsewhere in this issue, were marked by his ability and versatility in his achievements. At 43 he became the youngest Superintendent of the Line in his time. As Chairman of several committees, and in conjunction with the trades union, he guided the prolonged negotiations which led to an agreed pay-structure and conditions of service for traffic grades throughout the country. He served on a committee appointed by the Minister of Transport to report on automatic train control. Later, as the first Superintendent of the newly-formed Southern Railway, he was responsible, under the general direction of Sir Herbert Walker, the General Manager, for co-ordinating the differing practices of the five constituent companies. He played a prominent part in creating, on the Southern Railway, the largest suburban-electrified system in the world. He took an active interest in the Institute of Transport, of which he was a Founder Member. Throughout his long railway career, Mr. Cox showed not only great ability and integrity but a deep understanding of human problems.

Rhodesian Agency

TRAFFIC between Rhodesia and Nyasaland has increased appreciably since the federation of the three territories. As a result, Nyasaland Railways Limited, and its associated company the Trans-Zambesia Railway Co. Ltd. have installed a senior official as their representative in Rhodesia. Called the Rhodesian Agent, his office is in Salisbury, and he is in constant touch with traders, travel agents and the public to keep them informed of services to and from Nyasaland. He will also deal with any claims and complaints which may arise. In the course of his work he will visit most main industrial centres, and will keep in close touch with Rhodesia Railways to ensure the quick transit of traffic to and from Nyasaland, via Mozambique, by the express goods service which is stated to be giving great satisfaction to traders. As recorded elsewhere in this issue, the first Rhodesian Agent is Mr. E. J. Borron, Commercial Assistant to the General Manager of Nyasaland Railways Limited and Trans-Zambesia Railway Co. Ltd.

Financial Situation of Argentine Railways

GENERAL Carlos E. Salinas, President of Argentine State Railways (E.F.E.A.), replying to the demands of 6,000 railwaymen who recently came out on strike for more pay, has stated that estimated receipts for 1959 are 6,400 million pesos, and estimated expenditure, 20,500 million pesos, leaving a deficit of 14,100 million pesos. Of the expenditure, no less than 13,000 million pesos corresponds to salaries and wages. He pointed out that since January 1, 1956, railwaymen's wages had increased by 236 per cent. To comply with the demands for payment of retroactive increases in one lump sum would require the provision of 3,100 million pesos, which was absolutely impossible. Meanwhile the State Railways

management has studied the situation and decided that increases in charges of up to 400 per cent are necessary to reduce the annual deficit to reasonable proportions. The Transport Secretariat has made it known that it is not in favour of large-scale increases applied so rigorously, and is studying a scheme which provides partial and progressive increases, starting with the cancellation of recent reductions in first and second class passenger fares.

Overseas Railway Traffics

RAILWAY operating revenues of the International Railways of Central America for October amounted to $1,001,153, a decrease of $244,673 compared with October, 1957. Net income for the month showed a loss of $182,435 ($22,222 profit). Aggregate net revenue from railway operations for the period January 1 to October 31 showed a loss of $29,747 ($1,786,447 profit). East African Railways & Harbours approximate railway revenue for the month of October, 1958, amounted to £1,561,000 compared with £1,601,000 in October, 1957. Railway revenue up to and including the month of October amounted to some £15,650,000; £1,104,000 more than that recorded during the first 10 months of 1957. It is not thought that railway earnings during October this year were seriously affected by the Mombasa dock strike, because this took place during the first eight days of the month and the backlog of cargo from ships delayed was largely cleared by the end of the month. Salvador Railway Company receipts for September amounted to colones 283,000 compared with colones 160,000 in September last year. The aggregate receipts from July 1 amounted to colones 593,000 (colones 452,000).

Fall in Traffic in Malaya

THE recession in the tin industry and in trade generally in Malaya have badly affected the Malayan Railway. For the first nine months of the current year revenue from the railway totalled some $45 million against some $51 million for January to September of 1957. Receipts at Port Swettenham also compare unfavourably with last year's. Revenue from carriage of consumer goods in 1958 is expected to be $2,587 million less than for last year. Passenger receipts are lower than 1957 and by the end of 1958 it is estimated that they will be $1,276 million less than in the previous year. The six new Commonwealth Engineering diesel railcars give promise of considerable economies in operation but for several months they have been on trial in various parts of the system. The fall in receipts has stressed the need for economy in spending. Train mileage was reduced from around 445,000 miles in January to slightly over 390,000 miles in August, 1958. This was done by making use of the greater hauling power of the new English Electric 1,500-h.p. diesel-electric locomotives and by pruning services at weekends.

Doubling and New Construction in China

IMPROVEMENT and extension of the Chinese Republic Railways are making good progress. Double-tracking of the Peking-Hankow section of the Peking-Canton Railway, the main north-to-south artery of China, has been completed and opened between Peking and the Yellow River. On the section between that river and Hankow construction of bridges and culverts is proceeding, and most of the roadbed has been completed. On the Southern section, doubling is in progress between Hankow (Wuhan) and Chuchow, the junction of the line from Shanghai, and should be completed within a year. Construction continues of the Western line to the oilfields which eventually will link up with the Turk-Sib railway in U.S.S.R. Reference to this new work was made in our issue of January 10, 1958. A few weeks ago passenger traffic was inaugurated between Lanchow and the first station in Sinkiang Province, 720 miles. Within the next six months it is the intention to complete grading to Urumchi, and tracklaying as far as Hami. All these new railways are 4 ft. 8½ in. gauge.

The Key to Success

SPEAKING on December 11 as Chairman of the Governing Board of the Brunel College of Technology, Acton, Sir Miles Thomas advised 348 Napier apprentices not to regard security as the only key to happiness and success. Self-respect was more important, and the only real security. Advancement could only be gained by taking chances, not with one's work, but with oneself. The world today was insecure—safe living had died with Queen Victoria. "Rest In Peace" was all right for the dead, but "Up and at 'em" was a better slogan for the living. He urged his listeners not to be satisfied with a steady income, modest home, and uneventful life. They should seek something better, and not rely on others providing it for them. The history of Napiers, which covered a 150-year record of front-rank engineering, represented the kind of life for which humankind was meant. Sir Miles Thomas was speaking at the fourteenth annual presentation of indentures and awards to Napier apprentices which took place at Acton Town Hall, London. Further details of the occasion are given in our news pages this week.

South Africa's Example in Train Catering

GOOD restaurant car meals at very moderate prices have long been an amenity of travel over the South African Railways. At Christmas the administration is preparing to serve 3,000 seven-course dinners in 75 cars throughout the system at the modest charge of 5s. This seems to be even better value for money than usual. In 1956-57 the revenue of the Catering Department was £2,609,058, of which £651,037 was in respect of restaurant car services. Total expenditure was £2,923,774. A deficit on catering services, including meals in trains, is accepted in providing an essential amenity. Although train journeys in South Africa tend to be long, ample refreshment room and dining car facilities are provided for travellers over shorter distances. The policy is a wise one. The possibility of refreshments en route at all reasonable hours is, or should be, one of the advantages of a railway journey anywhere, lasting perhaps only an hour or two over a main line. It is the cause of many people travelling by train who might otherwise go by road.

Maintaining Good Service

THE need for good service and the continuance of the extra effort made by railwaymen at Christmastide is emphasised by "The Man on the Line" in the current issue of *British Railways Magazine*. Any railwayman who in the next fortnight or so is concerned with passengers, parcels, or goods, besides office staff in many departments, will find plenty of evidence that the season of Christmas is upon him. The handling of Christmas passenger and parcels traffic, the former often at a late hour on Christmas Eve, places a strain on many of the staff which they cheerfully accept. The good impression made during the Christmas period, when one of the greatest concentrations of passengers and goods is carried during the year, will be of little benefit if the effort is relaxed in the weeks to follow. The coming year will make heavy demands on the industry and initiative of all ranks of British Railwaymen, to secure traffic and to handle it efficiently.

Publicising Refreshment Cars

REFRESHMENT cars of some sort, whether restaurant cars serving full meals, or buffet cars, or both, are expected by passengers in most long-distance trains in Britain. Absence of these facilities, as in some relief trains, often causes indignation. In contrast, on recent journeys by medium-distance steam, electric, and diesel trains in the Home Counties our fellow passengers were

delighted to find or learn of refreshment facilities. The point is that they learned of, or came across, the buffet car when they were already in the train. The car staff often are too few and too busy to perambulate the train. Notices are displayed and leaflets distributed in some Continental trains, drawing attention to refreshment facilities. Leaflets make for untidiness, but notices, showing also the direction to the car, might be displayed in trains in Britain. There is little to distinguish the exterior of British Railways refreshment cars, unlike those of the Wagons-Lits Company on the Continent. No doubt this is for the sake of uniform appearance, but the matter might be reconsidered. Mention of refreshment cars is made in timetables and on indicators and boards at stations in this country, but sometimes rather modestly. The subject offers scope for some attractive posters.

Impediments to Travel

THE recent discussion in Parliament of the United Kingdom immigration regulations is a reminder that Immigration and Customs formalities at packet ports often adversely affect railway and shipping services by causing delays and, consequently, criticism of surface travel arrangements. Most travellers will agree that the Immigration and Customs officials at British ports are almost invariably courteous and usually expeditious. Nevertheless these processes on embarkation or disembarkation are an annoyance. More important is the fact that when the number of passengers is greater than usual, formalities delay departure of the ship or train. Conditions are better at some Continental ports when examinations are conducted in the boat trains en route, as they are at land frontiers in the case of all principal international trains. Even so a full, if punctual, boat train from, say, Paris can result in a late sailing from Calais, an even later departure from Folkestone or Dover, and with modernisation work and heavy traffic in Kent and south-east London, even greater delay in reaching Victoria.

Strengthening Gillingham Tunnel

CONCERN has been felt over the last 10 years or so for the continued stability of part of the 742-yd. Gillingham Tunnel, Dorset, on the West of England main line of the Southern Region, more particularly near the western portal. The tunnel was completed in 1859, on the then Salisbury & Yeovil Railway. Excavation throughout was mainly in a silty clay. At the western end this clay was fine grained and bands of sandstone rock and sand discharged much water into the tunnel. The clay in this portion exerted heavy swelling pressures during construction, and a brick invert was built to strengthen the tunnel footings. Cross-sections taken through the tunnel have shown frequent and abrupt changes of section at the western end, both in crown level and wall clearance. To remedy this a mass concrete invert, 4 ft. 3 in. deep with old rail reinforcing, is being installed throughout the western half. A soil survey confirmed the general condition of the linings by showing that the clay in the western half was both weaker in shear and of more treacherous character than elsewhere. The survey is being used as a basis for design of the new invert. A lighter design will be used in the eastern half.

Fixed Signal Recommended

THE collision at Arkleston Junction, near Paisley, on May 20, was due to a driver acting without sufficient care on the word of an inexperienced fireman who had seen a signal come off applying to the adjoining line, and moving forward, without exchanging signals with the guard in the van attached, according to rule. The guard also failed to act correctly. The engine came into the path of a passenger train and met it practically head on. Considerable damage was done and one passenger fatally injured. As will be seen from our summary in this issue of Colonel W. P. Reed's report, there was no shunting signal for the movement, although made regularly and somewhat involved; the driver should have made sure himself that the proper hand signal was being shown from the signalbox and it was proved that he could have done so without difficulty. Colonel Reed recommends that a fixed signal be now provided and draws attention to the desirability of making certain that the rules are thoroughly understood by firemen when being examined and passed as competent to drive.

House of Commons Debate on Transport

RE-APPRAISAL of the modernisation plan for British Railways, to be laid before Parliament by the early Spring of next year, implementation of the plan, amended as necessary, as fast as circumstances permit, and increase in savings to be effected in 1959 from £20 million to £30 million were among the chief points made by the Minister of Transport & Civil Aviation, Mr. Harold Watkinson, in last week's House of Commons debate. A summary of the debate is given in our Parliamentary columns. The occasion was the Minister's motion to read the Transport (Borrowing Powers) Bill for the second time. The Bill increases by £600 million to £1,200 million the amount which the British Transport Commission will be empowered to borrow for capital investment in the railways. The additional amount, as he pointed out, was authorised in 1954, when expenditure of £1,200 million was envisaged on a 15-year plan; as such it is not a new inflationary element in the national economy. An efficient railway system is essential to the economic existence of this country. To achieve it demands improvements which can only be effected with adequate expenditure. An important consideration which no doubt has commended itself to some Members is the large amount to be spent by the railways, as on diesel locomotives, which should go some way to counter the recession in industry.

Next year the amount spent on modernisation will be £178 million compared with £145 million this year. These figures compare with an originally planned investment of £135 million in 1958 and £140 million in 1959. Financial equilibrium is unlikely to be achieved by 1962, but the Government, which is prepared to underwrite the deficits of the Commission to the extent of £400 million, has rejected the notion for a subsidy, and has reiterated its declaration that the railways must pay their way. In view of these facts, the Commons agreed to the second reading with little more than the voicing of some misgivings, notably as to the ability of the Commission to achieve financial equilibrium in 1962.

The Commission and the managements of British Railways have had the modernisation plan under review for a long time, as is inevitable in continually changing circumstances. The Commission has already begun, at the request of the Minister, a review of the achievements under the plan up to the end of 1958 and the benefits obtained from it, to re-examine the future course of the plan, with particular reference to the next five years "related to the future size of the railway system needed in view of current economic developments and future expected requirements" and to re-appraise the economics of modernisation. How this will affect implementation of those parts of the plan envisaged during the next few months is problematical. Acceleration in the introduction of main-line diesel locomotives had already been planned as a ready means of securing much faster goods and passenger services. The Minister announced last week that by 1961, 1,100 main-line diesel locomotives would have been placed in service, which represents a remarkable achievement by private builders and railway works. With main-line electrification the Commission is to concentrate resources on the London-Midland Region line to Manchester and Liverpool and to accelerate its completion by several years so as to get a quicker return on capital, but no other scheme is to be abandoned. The examina-

tion of present and likely changes in traffic and re-assessment of the level of activity in the coal industry because of the development of oil, and the high price of coal, and future developments in atomic power should go to the root of the matter of freight traffic. These changes may not have been foreseen three or four years ago, but they have been studied by senior railway officers for some considerable time. As to the future size of the railway system, one may ask whether, apart from pruning of a few dead branches, and in view of the usefulness as feeders of the many branches which are by no means dead and cost little to work, any large-scale closing of lines is desirable. Meanwhile, vigorous efforts are being made, with the help of the new traffic organisations, to capture goods traffic even although they may be frustrated by the recession in industry, and more especially by the fall in coal class and mineral traffics. Mr. Watkinson was able to report that an agreement had been recently signed between the Commission and the Electricity Generating Board which meant that 3,000,000-4,000,000 tons of coal would be regained by the railways in the next six to 12 months, and more in succeeding years. It is hard to see how the £10 million, or 50 per cent, in savings is to be achieved this year. The Minister, nevertheless, is confident, and mentioned introduction of further diesel traction in the Western Region and a reduction in the major fleet as measures to effect part of the savings. The offer by the Commission to submit its estimates of economies to auditors appointed by the Minister, and his acceptance, are surely unprecedented in relations between the Ministry of Transport and the B.T.C.

Passenger receipts, though by no means as great as might be hoped, are holding their own, largely because of the improved service given by diesel trains and railcars. The Commission does not contemplate any overall rise in fares. Any increases must be governed by market considerations. There is much to be said for raising fares by luxury trains such as the "Master Cutler," mentioned by Mr. Watkinson, when the traffic will bear it; and also for higher charges for travel by some branch lines, at least as an experimental measure to keep the lines open—if customers can be found who will pay.

Decentralisation of railway managements is to take its course. We agree with Mr. Watkinson that "if in the process the trains should occasionally be of different colour, if old loyalties are revived, if closer contacts are achieved, I see nothing wrong with that. Indeed, I see in that the only future for the railways on the management side."

The Opposition View of the Debate

DURING the debate on the Transport (Borrowing Powers) Bill the main clashes between Government and Opposition were over the Minister's relation to the Commission and his handling of its finances. The Opposition view is that Ministerial interference is excessive and handicaps the Commission in the running of its own affairs. Mr. George Strauss carried this to the point of accusing the Minister of Transport & Civil Aviation, Mr. Harold Watkinson, of behaving like a "nanny" to a naughty child. It was therefore understandable that the Opposition's first reaction to the decision to appoint a committee to reassess modernisation was one of suspicion, even though it was the Commission which was to do so. Mr. Ernest Davies, while accepting that a reappraisal was desirable, questioned whether too great a burden was being placed upon the Commission. He instanced the two separate checks on economies that had been made by the Minister's auditors and feared such Ministerial interference encroached upon the independence and responsibility of those entrusted with the task of running the industry. The trade union spokesmen during the debate attacked the Minister for his interference in labour relations and suggested he treated Sir Brian Robertson, Chairman of the British Transport Commission, as an office boy.

The relationship between Minister and a Board of the nationalised industry for which he is responsible has always been difficult and ill-defined; but with the British Transport Commission it is understandable it should be somewhat closer than it is with the other public corporations. The Commission alone is being financed on a vast scale out of public funds. All borrow their capital from the State, but only the British Transport Commission has its deficits financed by it. Mr. Watkinson therefore has a special responsibility, more particularly to assist the B.T.C. ultimately to reach financial stability so that it need no longer call upon the Exchequer to meet its losses. In exercising this responsibility it may be that on occasion he has been over-zealous and has stepped too far across the demarcation line which separates commercial operations from policy matters. This has been the case in the past in regard to fares and charges and in view of past experience there must be some questioning as to whether the Commission's decision not to raise fares for six months is entirely its own.

Similarly, the Minister's insistence on economies, well meant as it is no doubt, may be driving the Commission to curtail services and restrict development which, if left free to exercise its commercial judgment, it would not do. In any case, as the Opposition pointed out, the seeking of economies is a continuing process and the Commission has succeeded in increasing its efficiency, which is the test of economy, to a marked degree during recent years. The Commission, which already has undertaken to save £20 million, has now been driven by the Minister to promise £30 million. The Opposition finds it difficult to believe this can be achieved without a sacrifice of some public services which fill a public need. This view may well be right. Mr. Ernest Davies pointed out that genuine economies were those which aided productivity, but that the closing down of part of one's business was not necessarily an economy. The inconvenience caused may far outweigh the monetary advantage. That could be the position if Mr. Watkinson insisted on forcing economies upon the Commission which caused it to terminate or reduce services it otherwise would retain. In such an event, the better alternative lies in the direction of differential charges which the Minister stated were being considered by the Commission. It is in the attraction of traffic and not in the curtailment of facilities that the final answer rests.

The Opposition's second main line of attack on the Minister was for his past optimism as to the Commission's financial position. When the sum of £250 million was fixed by Mr. Watkinson for deficit financing until 1962, doubts were expressed as to its adequacy. Unhappily, they have proved justified. Nearly half was drawn upon for 1956 and 1957 and the estimated £85 million deficit for the current year will reduce the fund to £47 million which indicates it will be exhausted next year. The fund voted for seven years will be used up in four: hence the necessity to increase it by £150 million. With this the Opposition had no quarrel, except that it accused Mr. Watkinson of shortsightedness, but it questioned the wisdom of burdening the Commission with so great a future liability. The full £400 million, it has been pointed out, is almost certain to be drawn and with deferred interest accumulating on this sum, and on current capital borrowings for modernisation, the Commission's unproductive indebtedness will be great indeed when the break even target date is reached in 1962. Mr. Ernest Davies suggested it might be £600 million, which meant that there would be a continuing addition to central charges of £30 million, with interest charged at 5 per cent. The Opposition doubts not only whether the Commission can ever repay the loans made for deficit financing but also whether it can meet its central charges increased by 50 per cent.

The new inquiry into modernisation provides the opportunity for examining the capital structure of the Commission, inasmuch as its terms of reference include the examination of steps necessary to achieve the earliest possible break-even date. An assessment of this possibility might result in the conclusion that its fixed

interest charges were so heavy, and were increasing to such an extent, that without a capital reconstruction aimed at transferring the burden the break-even date would have to be postponed indefinitely.

Transport Problems in East Africa

THE problems of transport in East Africa are expounded in a forthright manner by Sir Arthur Kirby, former General Manager of East African Railways & Harbours and now Commissioner for East Africa in London, in a recent talk to the British Railways (Western Region) London Lecture & Debating Society. East African Railways & Harbours, he states, suffers from difficulties inherent in any large-scale organisation, especially where the organisation is a State-owned public service. His own experience has left him with no belief in largeness for its own sake; and he considers that State ownership brings out the worst features inherent in large-scale organisations. Some concerns have combined the benefits of small-scale personal management with the advantages to be derived from large-scale organisations, but this requires highly skilled administration and freedom of policy. In East Africa the administration had to guard severely against the dangers of over-centralisation when it amalgamated its railway systems, the Kenya, Uganda and the Tanganyika Railways, and port undertakings. It was not always successful in maintaining a sufficient devolution of managerial authority, or at least a feeling of possessing that authority, at the medium and lower managerial levels.

As to the nationalised British Railways, he doubts whether the economic and operational advantages which were to have been derived from uniformity of policies and standardisation of equipment have not been more than offset by the deadening effects of the losses of enthusiasm and personal identification which seem to have resulted from the whole of the railways having become "one enormous, amorphous, State-owned concern." Because it applies also to East Africa in some degree, he adds that there is a serious danger on British Railways that a great deal of money and effort may be sunk into improvement of outworn operational techniques whereas what may be necessary is a re-appraisal of the total transportation requirements of the country. "Railwaymen," he states, "indeed most people in Britain where the railway was born, have an ingrained belief that we must inevitably have railways; it is a fundamental concept in our thinking and we cannot approach the problem unbiased. This inhibits any scientific appraisal, without which we cannot be sure that the large sums we are spending on railway improvement is the best way towards comprehensive transport efficiency."

In East Africa the difficulties of administering a large organisation are exacerbated by the necessity to operate in three territories, Kenya, Uganda, and Tanganyika, each of which has a different political basis, divergent national aspirations and many varieties of peoples. Staff problems, he explains, are sometimes "nightmarish" because of restrictions on movement, different educational policies, and incidence of taxation. Each territory has to have separate trade unions. Agreement on policies, whether concerning rating or staff management or general development is possible only by consultation between the representatives of three Governments, each of which has some special interest or objective. East Africa Administration has some small idea of the difficulties confronting the European Common Market countries. The consultative body is a Transport Advisory Council whose members are appointed by the Governments. From his personal experience, Sir Arthur Kirby states that nothing can be worse than for the affairs of a railway or a port undertaking than for them to be decisively influenced by political considerations of local political manœuvrings. This sort of thing is difficult to combat where the concern is State-owned, and there exists the ever-present possibility of Governments wishing to use the State-owned concerns as a political instrument. In East Africa, railway rate-making has frequently had to conform to political pressure with, in his view, lamentable consequences. Staff policies are similarly affected. Many of the indigenous Africans are becoming qualified to take more senior posts with the railways and ports. The policy is to train the indigenous peoples eventually to become capable of management, but a present danger is that political clamour may result in people being placed in positions of responsibility and in posts requiring technical proficiency long before they have acquired sufficient maturity of experience. A serious problem in East Africa is the fact that the indigenous African, of so many different tribes, has not yet acquired the qualities of impartial industrial discipline; that is, a discipline which does not derive from tribal custom. Good African supervisors, he stresses, are hard to find and the individual African does not yet like subjection to the discipline of another African, possibly of another tribe. There have been frequent occasions where African staff have appealed to be removed from the disciplinary control of an African and be allowed to revert to control by a European. This is not because of any liking for the European but because he can be expected to be impartial in both justice or injustice.

Construction Organisation in the Tropics

(By a correspondent)

FROM the technical point of view railway constructional works are described from time to time, but less attention is usually directed to their organisation and planning. For this reason an article entitled "Planning a Construction Project" in our contemporary, *Indian Railways*, contributed by Mr. Arya Bhusan, an engineer on the Northern Railway. It was inspired by the construction programme embodied in the series of Indian Five-year Plans. The author points out that (*a*) during the first five-year period 400 miles of new line were built; (*b*) for the second period 842 miles were projected; and (*c*) for the third 3,000 miles, if funds were available.

These formidable figures apply to all India and its seven railways, but they remind one of events, of which we had intimate personal experience, about 30 years ago, when a single railway administration in British India successfully initiated a 300-mile-a-year construction programme. During the first year of that programme and the preceding year 3,000 miles of line were surveyed (engineering and traffic surveys), and by its end over 300 miles of new line had been opened for traffic. The organisation required to set in motion the widely-spread programmed works involved the appointment of no fewer than 40 officers and corresponding subordinate staff, and arrangements for the letting of large contracts for the construction of new bridges spanning four of India's great rivers, subsequently completed, as well as the first steel arch erected in that country.

However, Mr. Arya Bhusan's article continues with a list of the personal characteristics necessary for the head of an important project, and explains how essential is the preliminary planning of the work stage by stage. We agree with him in this and also that officers should be appointed to a construction well before the field-work is to begin. This enables them to acquaint themselves with the terrain and locally-available materials, and to plan the posting of and accommodation for their staffs. Once on the work they should not be transferred away from it before its approaching completion, when the establishment can be gradually reduced as required. "Liberal provision of supervisory staff," he writes, "will pay itself many times."

Besides their technical qualifications construction engineers in a country like India should be conversant with the essentials of land acquisition procedure and should be able to discuss with the civil authorities such matters as those concerning local labour, food supplies, level crossings

and waterways. A specially appointed civil service land acquisition officer is often advisable. Considerations in the selection of headquarter sites for office and fieldwork are then discussed in the article, whether using existing accommodation or erecting temporary buildings. Prime considerations are a suitable and adequate water supply, sanitary and medical provisions. The health and contentment of the staff are all-important. In the appointment of field and office staff integrity, energy and experience—for at any rate its nucleus—should be looked for. Staff should be encouraged by liberal construction allowances to compensate for separation from families and/or comparative discomfort in the wilds.

An efficient transport organisation is essential, usually by the construction of a service road for road vehicles, but where heavy parts of girders and plant have to be carried to the sites of large bridges a service line will be necessary. Telecommunications contribute to construction efficiency, especially by linking headquarters with field supervision, and in arranging for the regulation of the supply of materials. Their requirements must be worked out as far as possible in advance and their procurement phased so that field units are not starved and a smooth and continuous flow is provided to insure uninterrupted progress.

Turning to plant availability, the author of the article issues timely warning about adequate spares, maintenance facilities, and efficient operating staff. He also gives sound advice concerning the selection of contractors; a knowledge of the integrity, capacity and past records of firms is most valuable. For contractors doing quality work a reasonable profit should not be grudged. It is advisable for the "small men" to get regular and quick payments, otherwise they will be unable to pay and retain their labour. To experienced construction engineers all these points, which we endorse, may seem commonplace, but to many others they may give some idea of the purely organisational requirements of construction work in countries such as India.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of Correspondents)

The Decline in Freight Traffic

December 3

SIR,—Your columns seem to suggest that main cause of the decline in freight traffic is the recession in industry coupled with a falling-off in the use of coal. No doubt this is true, but surely the biggest single factor was the railway strike in 1955, and a secondary factor the increases in freight rates. At the time of the strike many road hauliers succeeded in extracting long-term contracts from grateful customers. A lot of traffic will never come back to the railways.

Yours faithfully,

J. B. LATHAM

Channings, Kettlewell Hill, Woking

Freight Traffic on U.S.A. Railroads

December 10

SIR,—Since the article in your December 5 issue was written, another candid report from the Association of American Railroads shows slow, but distinct progress in four weeks from October 12 to November 8. For 45 weeks wagon loadings were 5,227,500 below 1957, a decrease of 16 per cent. Grain loadings numbered 2,512,870, a rise of 8·8 per cent to an all-time high level. Record grain crops were reaped in the U.S.A. this year and heavy movements of grain are expected to begin in January.

Though forwardings of other classes of commodities were less than in 1957, the rate of decrease was slower, save for overseas coal shipments, which over 10 months to October declined by 18,150,500 tons, or 35 per cent. The growing stocks of coal in this country and on the Continent have halted the demand for American coal.

In October, the average daily surplus of wagons on U.S.A. railways fell to about 11,600, and freight revenue improved. For nine months to September it was 12·3 per cent under 1957, compared with 13·5 per cent at the end of August. Passenger revenue was not much better and parcels brought in 8 per cent less receipts, but mail payments increased by $29 million, or 14 per cent. Operating expenses were reduced by fully 9 per cent and net railway operating income (earnings before charges) at 487·8 million was only 30 per cent less than a year ago, against a decrease of 48 per cent at June 30.

The railroad position improves gradually. At September 30, the Pennsylvania reduced its deficit to $318,232 from $12 million in June. The number of railroads in deficit was then 17, whereas in June, 29 were "in the red." If the national economy settles down once more on an even basis, the railroads will surmount this crisis as they have come through many previous emergencies. They have one great advantage in publicity arrangements which tell their revenue and expenditure in detail from month to month and explain current transport developments by using apposite statistics.

Yours faithfully,

YOUR CORRESPONDENT

Westminster, S.W.1.

The First Excursion Train

December 8

SIR,—I refer to Mr. Inkpen's letter published in your December 5 issue. According to the "North Eastern Railway: Its Rise and Development" by W. W. Tomlinson, page 365, the Stockton & Darlington Railway appears to have been one of the first lines on which provision was made for the poorer class of railway travellers. A large number of persons, it was found, who could not afford to pay the 4d. fare between Stockton and Middlesbrough had got into the habit of walking along the railway. To stop a dangerous practice and secure additional revenue, the directors decided to carry third class passengers on the Middlesbrough branch in wagons without springs but furnished with seats, "the same to be hauled by the coal engines as often as there may be a sufficient number of passengers to go either way." These third class trains began running on December 14, 1835, the fare being 2d. or practically ½d. per mile. In May, 1838, between 800 and 900 persons a week availed themselves of this cheap mode of travelling.

Yours faithfully,

JOHN R. HIND

3, Draycott Close, Kenton, Harrow

Comfort in Excursion Trains

December 2

SIR,—I have found it necessary in recent weeks to complain of cold carriages. This is a plea for the older passenger in particular, and especially for those who travel by excursion train.

I would also suggest a more convenient arrangement for light refreshments in trains. Catering staff do not always bring them to compartments. The one, often distant, kitchen car could well be replaced with two smaller, evenly-spaced units, to the benefit of passengers and staff alike.

Yours faithfully,

H. H. BRIDGE

45, Churchill Crescent, Farnborough, Hants

THE SCRAP HEAP

No Dancing Saloon

A night train to be introduced next summer between Vienna and Zürich is to be named "Wiener Walzer" (Vienna Waltz). Unlike the former "Côte d'Azur Pullman," which ran by day for a few years between the wars from Paris to the Riviera, it will include no dancing saloon. The latter was one of the Pullman set, specially fitted and decorated. It is believed to have been the only such vehicle to run in a regular train. A good many excursion and similar train sets on the Continent include coaches equipped for dancing.

Slip Carriages

A man has just told me that as a part of their modernisation British Railways are going to abolish slip carriages. . . . In all the years between the wars the slipping area was steadily contracting, until slipping carriages, like cider and White Horses, came—I know not why—to be a habit of the West Country and of nowhere else in all the world. . . . You board the "Cornish Riviera" or one of the other great West Country expresses. The main train goes careering down to Plymouth without a stop, but the men of Wiltshire and of Somerset get into the rear coach and are quietly slipped off at Westbury with no trouble to anyone.

Though all the rest of the world had turned against it we went on being slipped at Westbury right up to the war. Then it was feared that Hitler might hear about it and we should lose the war. . . . We had to go round by Chippenham and do all sorts of things that no nice-minded girl would like to do. But England called us and we obeyed. The war ended and slip carriages at Westbury came back. . . .

Westbury, ever since time began and since the White Horse was first pricked out upon its Downs, has been the home of slip carriages, and why, Sir Brian Robertson, should not we at Westbury, as we have always done, continue every weekday to see three slips come sailing by, and one on Sundays?—*From an article by Christopher Hollis, reproduced by courtesy of "Punch."*

Personal Service Station

The station with the personal touch . . . our aim: to provide you with the comforts of home. That is the slogan Stationmaster Alfred Vince has had painted over the booking office at Romsey, Hampshire. But Mr. Vince is not finding it easy to keep up. This is why: When the station staff hollowed out some tree stumps, filled them with earth, and grew flowers . . . passengers picked the blooms. When the station was painted green and cream . . . the paintwork was defaced with scribbling several inches high.

But Stationmaster Vince and his staff will not give up. So, as has often happened before, if it is very cold and a passenger has a long time to wait he may find himself being offered a cup of tea "on the house."—*From the "Daily Mail."*

Arms of the G.N.R.(I.)

The partition of the Great Northern Railway of Ireland between the Ulster Transport Authority and Coras Iompair Eireann involves disappearance from locomotives, rolling stock, publications, and so on of the last arms of a major railway company to have been displayed in recent years. The garter is blue. In the first quarter of the shield are the arms of Dublin, with those of Londonderry in the second, Enniskillen in the third, and Belfast in the fourth quarter. Overall there is a gold inescutcheon (a small shield placed in the centre of the large shield) charged with the red left hand of Ulster. The coat of arms looked particularly well on the tenders and splashers of the blue 4-4-0 simple and compound express engines.

Arms of the G.N.R.(I.), now being removed from locomotives and rolling stock

Bogus B.T.C. Police

Two men dressed as police constables tried to steal mailbags from a G.P.O. truck in Leeds Central Station. The men attacked the mail driver with a pick-axe handle and a running fight developed on the station platform. The "policemen" escaped in a van. Police took fingerprints in a saloon car found on the station precincts.—*From "The Daily Telegraph."*

"Furnace upon Wheels"

A hundred years ago, John Ruskin protested against the opening of the Foxfield to Coniston branch line in North Lancashire. In 1958 the Friends of the Lake District protested against its closure. And when that protest failed—as most protests of that kind usually do fail—scores of people turned up on the train's last day to make a nostalgic final trip to Coniston and back. I was one of them myself. So the railway, which had once seemed the destroyer of the countryside—

> . . . a furnace upon wheels
> Like a mad bull, tail up in air . . .

—this same mad bull has now come to look agreeably tame and familiar, a fit companion for cows and corduroys. —*Norman Nicholson in a B.B.C. broadcast.*

[The Coniston Railway, from Broughton, near Foxfield, to Coniston, 8¾ miles, was opened on June 18, 1859. It was worked by the Furness Railway, with which it was amalgamated in 1862. The line became part of the L.M.S.R. in 1923, and of British Railways, London Midland Region in 1948. It was closed on October 6 last.]

Another Christmas Eve

From every compass point they come
For the great Festival of Home.
All through the day the trains have run,
Criss-crossing with their loads of fun.
The firelight, flickering in the gloom,
Illuminates the waiting room.
Outside, a Christmas moon rides high
In an immensity of sky.
Once more life has its ancient poise,
An oasis amid the noise
Of clamouring tongues and secret fright.
The signal lamps gleam through the night
As a clean freshness in the air
Seems to make mockery of care.

Here, with a little time to spend,
We may encounter some old friend.
Or look, with keen, remembering eyes,
For little things to recognise.
Gone are the woes of yesterday,
Our feet are on the homeward way.
The climax of a year-long dream
Where old nostalgia reigns supreme.
Then, puffing, panting round the bend,
Enters an old, familiar friend
And, as we board the branch-line train,
It's home for Christmas once again.

A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Travel Concessions for Christmas

To cater for holidaymakers during the Christmas week-end the South African Railways is extending the availability of week-end excursion tickets for travel in the Union, South West Africa, and to Mozambique. Passengers will be able to start their journeys as early as 3 p.m. on December 24, or earlier if the last train for the day leaves before 3 p.m., and must complete their return journeys by midnight on December 29.

Holders of ordinary short distance return tickets, between points up to 25 miles apart, issued on December 24 and 25, will also be allowed to complete their return journeys by midnight on December 29, instead of December 27, or 28, as would normally be the case.

WESTERN AUSTRALIA

Centralised Traffic Control

A C.T.C. system is being installed progressively on the 35-mile section of the South Western main line between Armadale and Pinjarra.

Initially, the signals and points for the various stations en route have been remote controlled from local panels. As the main installation progresses, the operation of these points and signals is being transferred to the main central control panel at Perth Station.

The first stage of C.T.C. came into operation between Armadale and Byford, a distance of five miles, on October 5. This was extended a further five miles to Mundijong on October 19, and more sections will be brought under central control in progressive stages.

The South Western main line is one of the busiest in the State. It is the main link with the lower South Western lines which serve a prosperous mixed farming region and also with Collie the main coal producing centre. With the completion of C.T.C. the track capacity of the sections under control will be increased from 26 trains daily to an estimated 50 trains. This will be accomplished without any additional station staff and if necessary, intermediate sidings can be operated without the staff now required for signal purposes.

The normal benefits of C.T.C., namely acceleration of schedules, speedier crossings and run-rounds, and greater efficiency, will result and generally provide for more economical operating of the service.

Hot Water for Country Trains

The supply of hot water for use in hand basins and showers on the Government Railways country train services has been facilitated by provision of new oil-fired boilers in the Perth carriage sheds. The boilers have a capacity of 1,600 gal. and they are automatically fired whenever the water temperature drops below the required minimum. The hot water is conveyed through insulated pipes to several points inside the sheds whence it is fed into the insulated tanks of the carriage.

VICTORIA

Refrigerator Wagons

Specially adapted refrigerated wagons are being used on the fast freight service in each direction between Melbourne and Mildura. High speed passenger bogies have been fitted, and the wagons are divided into three independently iced compartments varying in size for the conveyance of perishables, such as fish, butter, and ice cream. The perishables are kept in separate sections and there is no risk of contamination.

General view of the C.T.C. control panel at Perth

UNITED STATES

Restoration of Salary Cuts

Last April the Pennsylvania Railroad cut by 10 per cent the salaries of all employees earning more than $10,000 a year, and a month later the Delaware & Hudson followed suit, in this case with salaries of $8,000. Both railways have now restored the normal salaries because of an improvement in the situation. The New York Central System is considering the restoration of its 15 per cent cut from January 1 next.

Testing French Rail Welding

A reputedly improved method of rail welding developed in France and known as the Alumino-Thermique process is now being tested on the Chesapeake & Ohio Railway. It appears to be a form of thermit welding with a secret powder melted and automatically injected into the welding area. Though favourably reported upon in France, this process has not yet undergone sufficient testing on the C. & O. for any pronouncement upon it to be made. The advantages claimed for it are that as well as producing sound welds and smooth joints, it is carried out with speed, economy and simplicity. If successful in America, it is hoped that this process will be widely used for welding 39-ft. rails in the track, instead of complete reliance being placed on the shop-welding of long welded rails and the somewhat cumbersome methods of handling the lengths and railing them to site.

Atomic-Powered Switch Lamp

At an industrial siding at Altoona, Pennsylvania, the Pennsylvania Railroad has installed a switch lamp lit by Krypton 85 gas, which is expected to stay lighted for at least 10 years without refuelling or any other attention. This type of lamp was first developed and put in use by the Denver & Rio Grande Western Railroad.

P.RR. Services from New York

For some time past the Pennsylvania Railroad has not been deriving what it considers an adequate share of the passenger revenue from the through trains between New York and places in the South and South-West, which it works over the 225 miles of its own tracks between New York, Philadelphia, Baltimore, and Washington. These trains are chiefly for destinations on

the Seaboard and Atlantic Coast Lines, such as Miami and other Florida resorts, and on the Southern Railway, such as Atlanta, Birmingham and New Orleans; and whereas the sleeping cars and coaches may be fully occupied from Washington onwards, this is not the case over the Pennsylvania part of the routes concerned. The P.RR. is therefore proposing to charge a reservation fee of $2 on all through sleeping car tickets and of $1.50 on all "coach" class tickets from Pennsylvania stations to destinations beyond Washington, to help recoup some of its heavy terminal expenses.

New York Central Building

The New York Central Building at 230, Park Avenue, New York, has been leased to a Manhattan real estate investor for 50 years, and its name has been changed to New York General Building. The railway retains the space in the building which it occupies already, and there are 141 other tenants. The total rentals for the fifty years are expected to exceed $150,000,000.

BRAZIL

New Works in Progress

The Joaquim Murtinho-Jaquaraiva diversion, on the Paraná-Santa Catarina Railway, has been opened to traffic and the Farbio Rego deviation is to be completed this year. The Lins-Aracatuba divertion, on the Noroeste Railway, will also be completed this year, preparatory to installing broad gauge (5 ft. 3 in.) track between Bauru and Aracatuba.

On the Central of Brazil Railway, besides completing the diversions between Barra do Pirai and Sao Paulo, improvements have been authorised on the Sertao line, from Esperanca to Sete Lagoas and Corinto, including the laying of broad gauge tracks to Pirapora.

Construction of the line from Lavras to Divinopolis, on Rede Mineira de Viacao, is being accelerated and plans have been approved to replace 2 ft. 6 in. gauge tracks with 5 ft. 6 in. gauge between Antonio Carlos and Aureliano Mourao. Modern signalling equipment is being installed on 186 miles of line, 111 bridges are being strengthened, 50 marshalling yards built, and 14 new repair shops equipped.

ARGENTINA

Track Renewal

The State Railways has transferred to Buenos Aires Transport sufficient steel rails of Russian origin to enable the track of the L. N. Alem-Federico Lacroze underground railway to be completely relaid.

Local Construction of Railway Vehicles

Construction has started on the new Materfer plant being built by Fiat at Ferreyra, Province of Cordoba. Production at the plant will include diesel-mechanical, diesel-electric, diesel-hydraulic, electric, underground railway, and ordinary passenger coaches.

The plant is being erected in accordance with the contract signed by Fiat with the State Railways last April, by virtue of which 210 motor and trailer coaches are to be supplied, 120 being of local construction. It will cover an area of 234,414 sq. yd. with seven bays 52 ft. by 75 ft. and employment will be provided for 1,000 workmen. The initial production will be 12 to 15 railway vehicles per month, and 150 to 180 different types of diesel and electric vehicles for urban and inter-urban transport. The railway motor and trailer coaches will use 42 per cent of Argentine material.

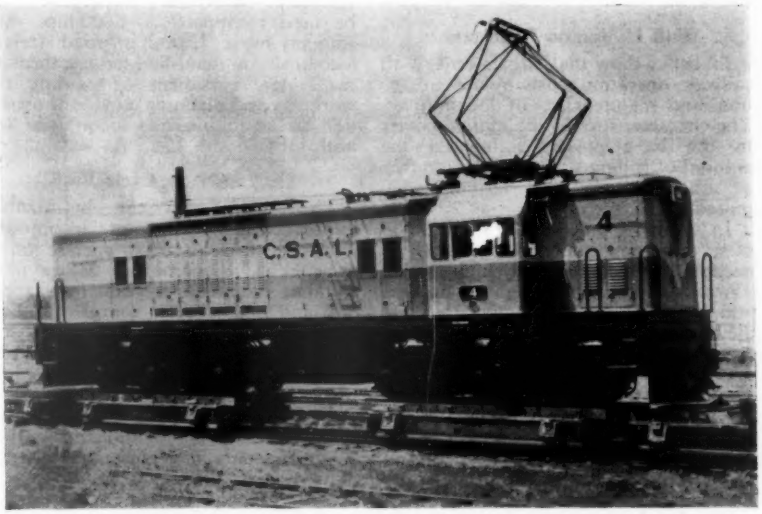
This plant will necessitate the investment of US$1,500,000 and 210 million pesos for its completion, and will ultimately facilitate the saving of U.S. $6,000,000 a year in foreign exchange.

CHILE

Industrial Railway Operation

The Anglo-Lautaro Corporation recently placed into service 13 International General Electric locomotives in Northern Chile. The company operates an industrial railway system as part of its nitrate mining operation. It begins at the Pacific Coast port of Tocopilla and runs 62 miles inland. It has some of the steepest gradients in this area of South America, beginning at sea level and rising to a maximum elevation of 4,888 ft. in 31 miles.

Eleven of the new units are diesel-electric locomotives, and two electric locomotives. Eight of the diesels are 73-ton, 720-h.p. units, and three are 1,320-h.p. type "U12C" universal locomotives. The 600-V. electric locomotives are special conversions of the General Electric universal type diesel-electric locomotives.



One of the two 600-V. electric locomotives built by International General Electric Company for the Anglo-Lautard Corporation, Chile

ITALY

New Works in Sicily

The programme of modernisation and electrification in progress in Sicily comprises electrification of the 59-mile Messina-Catania main line. Preliminary work in connection with the conversion of the Catania-Syracuse line, 55 miles, is to be taken in hand in the near future. Advantage will be taken of this opportunity for doubling the five-mile section between Catania Central Station and Bicocca in the south where the main line through central Sicily for Palermo bifurcates. Track is to be removed on the entire Messina-Syracuse section.

A new standard-gauge railway between Alcantara, on the Messina-Catania main line 32 miles south of Messina and 2½ miles to the south of Taormina, and Randazzo, is to be built. The country traversed is the most intensely cultivated citrus fruit area in Sicily.

FRANCE

Battery Maintenance at Bordeaux

Many improvements have been made to the battery repair and maintenance centre at Bordeaux-St. Jean. With the increasing use of diesel power, battery repair has become a problem of added importance and the centre now incorporates three separate workshops, one dealing with lead batteries, one with cadmium-nickel (alkaline) batteries, and the third with the repair of dynamos, regulators, etc. The Bordeaux centre is responsible for the repair and maintenance of at least 70 per cent. of the batteries in the South Western Region of the S.N.C.F. In 1957 it dealt with an average of 3,400 units a month. For 1958 the monthly average will be about 4,500.

Improving Utilisation of Motive Power

Increased operating efficiency from pooling and operation of diesel-electric motive power on cycle basis with centralisation of maintenance

By G. T. Bevan

Locomotive & Car Equipment Department, General Electric Company, Erie, Pennsylvania

THE advantages of the diesel-electric locomotive must be thoroughly understood and fully used to obtain maximum benefits. The combination of the diesel engine and the traction generator makes constant horsepower available over a wide speed range. This means hauling more profitable payloads at greater speed, which allows of a new approach to motive power operation. Many railways changing over to diesel-electric traction have found that they can double the annual locomotive mileage formerly obtained with steam. This increased mileage, plus the ability of the diesel-electric locomotive to produce more gross ton-miles per train-hour, can lead to a reduction in the number of motive power units in service, which will lower operating costs. The result is that diesel-electric locomotives can do one-third more work in a day at approximately one-half the cost of steam locomotives for the same operation.

Full Utilisation Important

Statistics show that 50 per cent of all railway operating costs relate to the user and maintenance of locomotives. The characteristics of the motive power in use have greatly influenced the amount of rolling stock and the number of tracks, yards, and terminals required.

In the early stages of conversion to diesel traction, little effort generally is needed to obtain relatively high motive power user. Operating advantages and savings are so attractive that the diesel-electric locomotives are worked to the fullest possible extent. As dieselisation progresses the situation changes. The new motive power can no longer be assigned exclusively to 24-hr. duty. Its economic advantage over the steam locomotive, therefore, becomes less marked. Means must be found to increase motive power.

This has been greatly simplified with the recent introduction of the "universal" or "road-switcher" type of locomotive. Its construction and operating characteristics have been chosen to make it capable of all three types of service: goods, passenger, and shunting. Operating experience in several countries has already demonstrated its success. Besides its flexibility, the "universal" design has other economic advantages. Its initial cost is approximately 12 per cent lower than that of the "road" type of comparable horsepower. Maintenance costs are also greatly reduced, often by as much as 10-15 per cent.

In many instances divisional or district areas and boundary points for changing locomotives, which were established for steam locomotive operation, are still in use. Consequently there is some danger that the superior performance of the diesel-electric may be hampered by boundaries established earlier to meet the limitations of the steam locomotives. The entire scheme of railway operations, including yard and terminal facilities, track capacities, and methods of train operation, should be analysed to determine its suitability for diesel-electric operation. Only as this new type of locomotive is freed from the shackles of the steam locomotive's limitations can its potential capabilities be fully realised in terms of increased productivity and earning capacity.

The "universal" or "road-switcher" locomotive is a motive power tool with which railways can do a highly efficient job. Units of this type can be held in locomotive pools, available for any service as required. For examp'e, a single 1,500-h.p. universal locomotive can be used to replace a 1,000-h.p. yard shunter or a 1,500-h.p. road freight locomotive in main-line service, through the simple expedient of pooling the workings and planning a cycle of operation so as to use one locomotive for both jobs.

Operation on Cycle Basis

These economies can be further improved by arranging locomotive duties so that all units operate on a cycle basis. Locomotives return to a common maintenance point for inspection and repairs after completing their tours of duty. The length of time and mileage they cover between inspections is determined by a routine schedule worked out by the operating department. In arranging such schedules an effort should be made to make sure that all units accumulate approximately the same mileage between inspections.

Under such a system, a locomotive might spend three days covering the 1,000 miles between A and B and back. After the first 1,000 miles, it would be inspected. It would then spend three more days covering the 1,000 miles between B and C and back. It would then be inspected and so on, cycling back and forth through B, the maintenance station. During its two three-day runs on either side of B, it would be regularly scheduled for various duties which can include passenger, goods, and shunting service.

Short Layovers

This type of operation has several advantages. One of the most important concerns layovers at termini. When locomotives are operated on a cycle system, with maintenance at a central point, they can be ready for re-assignment to other duties in as little as 10 min. after arrival at a terminus. This means that fewer locomotives are required. Consequently, not only is the rate of return on total motive power investment higher, but operating expenses are reduced because there are fewer locomotives to maintain. This high availability of the diesel-electric has permitted user that was not practical even with modern steam locomotives.

Availability and Utilisation

The difference between the terms availability and utilisation of locomotives can be seen from their definitions. Availability is the time a locomotive is available for service, expressed as a percentage of total time. For example, if a locomotive is in the shop for inspection and repairs 2 hr. out of 24 hr., the availability is $\frac{24-2}{24}$, or 92 per cent. The availability of the diesel-electric varies from 86 to 95 per cent.

Utilisation is the time that a locomotive is actually in operation, expressed as a percentage of total time. For example, a locomotive is assigned to shunting duty for 8 hr. and then to road service for 12 hr. It is in use 20 hr. out of 24. The utilisation, therefore, is 83·2 per cent.

Minimising Non-Revenue Service

One factor affecting locomotive utilisation is non-revenue service, which should be kept to a minimum. Wherever possible, the units should be scheduled to work in revenue service when travelling to and from maintenance points. The use of diesel-electric locomotives on work trains should be avoided except in cases of absolute necessity. Maximum use should be made of off-track equipment, for work on the line, so reducing the need for work trains.

High locomotive utilisation is not necessarily limited to the large transcontinental railways of the U.S.A., which enjoy exceptionally long-haul traffic. Many smaller railways with short hauls have done an outstanding job in this respect, sometimes operating diesel-electric locomotives over five times the daily average mileage formerly run by steam.

The combination of higher locomotive utilisation resulting from the pooling and cycling of motive power, with centralisation of maintenance has proved a most effective tool. If it is intelligently applied, it will serve to bring out the potential capabilities of the diesel-electric locomotive, resulting in a corresponding improvement in efficiency and economy of operation.

Diesel-Hydraulic Shunters for Industrial Lines

Simplicity of control, inclined engine installation, and alternative wheel arrangements

TWO types of 170-h.p. diesel-hydraulic locomotives for shunting in light industrial plants introduced by the Yorkshire Engine Co. Ltd., Sheffield, a subsidiary of United Steel Companies Limited, were developed in collaboration with Rolls-Royce Limited. Each is fitted with a Rolls-Royce normally aspirated engine, built at Shrewsbury, coupled to a Rolls-Royce twin-disc torque converter manufactured at Crewe. As will be seen in the broken outline in the drawing of the four-coupled version, the engine is set in the frames at an inclination to the horizontal so that the torque converter output shaft drives directly through the axle-hung double-reduction gearbox with servo-operated reversing gear.

These locomotives have been designed to be adapted to suit any gauge between 3 ft. and 5 ft. 6 in. and the overall height can be reduced to 9 ft. 10 in. for standard gauge and even less for narrower gauges.

Leading particulars and dimensions are as follow:—

Wheel arrangement	0-4-0 or 0-6-0	
Weight	28 tons	
Maximum tractive effort	16,400 lb.	
Continuous tractive effort	14,800 lb. at 1·3 m.p.h.	
Total installed engine rating (temperate sea level conditions)	178 h.p. at 1,800 r.p.m.	
	ft.	in.
Length over buffer beams 0-4-0	18	6
0-6-0	19	2
Length overall (1 ft. 6 in. buffers) 0-4-0	21	6
0-6-0	22	2
Width overall, standard gauge *	8	5¼
Width over cab, " " *	7	10
Height over cab, " " *	11	3¾
Minimum rail clearance	0	5¼
Wheelbase 0-4-0	6	0
0-6-0	9	0
Wheel dia.	3	3
Fuel tank capacity*	200 gal.	

* Overall width, cab dimensions and fuel capacity may be altered to suit loading gauge

As the engine/converter set is compact and independent of the undergear most of the locomotive weight is used in providing a rigid frame. This is of rolled steel plates and fabricated stretchers, all bolted together. The heavy-section buffer beams are brought down to 5¼ in. from rail level to protect the gearbox in case of derailment. The axlebox guides are steel castings fitting closely to the frames, secured with driving fit bolts and are fitted with manganese steel liners.

A heavy steel decking combined with the platforms, extends over the full length and is cut away for the engine and transmission. The fuel tank is mounted transversely in front of the cab on the decking plate.

The Timken taper roller bearing axleboxes are grease lubricated and are fitted with manganese steel side liners. Laminated bearing springs with adjustable sword-type hangers rest on the axleboxes and can readily be changed. Cast-steel wheel centres with steel tyres are keyed and pressed on to solid forged axles and fitted with forged crank pins pressed into the wheel centres. The revolving masses are fully balanced in the design of the wheel centres. Forged and machined steel coupling rods are provided with solid leaded phosphor bronze bushes.

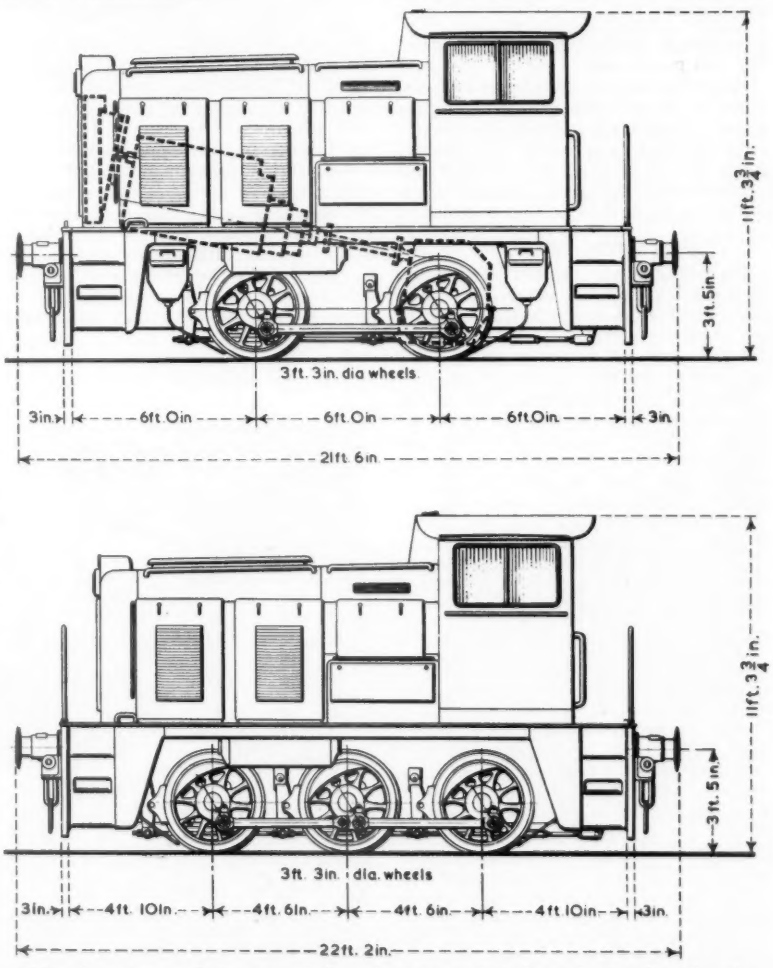
Power Brakes

Westinghouse straight air brakes are fitted. The brake pressure at the cylinders is 50 lb. per sq. in. The compressor, as standard to the Rolls-Royce C.6 oil engine, has a nominal capacity of 15 cu. ft. per min. at 1,000 r.p.m. and is driven by vee belts from the engine. Provision is made for adjustment of the brake rigging. Turplat forged side buffers and gedge hooks with three link chains are fitted as standard. Special buffing and drawgear can be fitted to suit customers' requirements.

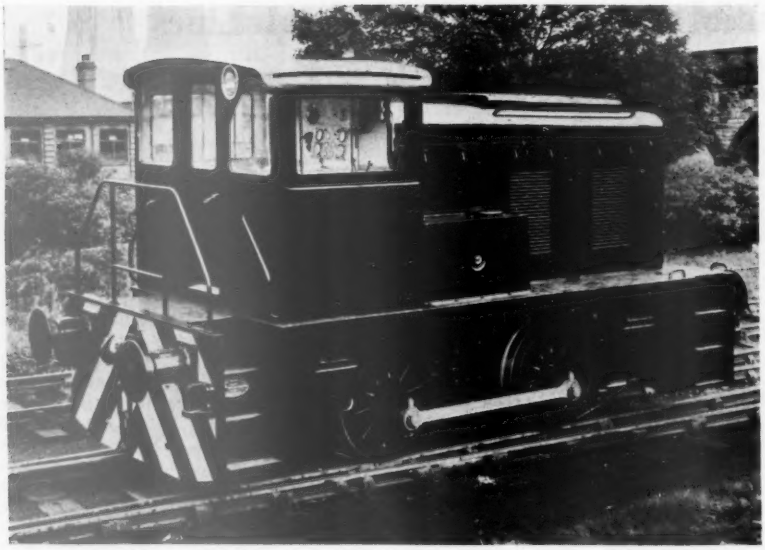
The windows of the cab are fixed with rubber sealing strip. Controls are duplicated on either side.

Cab equipment includes a Servis running hours recorder and a Clayton Dewandre heater.

A Rolls-Royce six-cylinder, normally-aspirated C6NFL type oil engine is used, directly coupled to a Rolls-Royce Twin Disc three-stage type CF.10,000 torque converter. The engine is of the four-stroke direct-injection type with liquid cooling, bore 5⅛ in., stroke 6 in., displacement 742·64 cu. in. and compression 16:1. It develops 178 b.h.p. at 1,800 r.p.m. Replaceable "wet" type cylinder liners, and pre-finished steel-backed copper/lead type main bearings are used and the nitride-hardened crankshaft has a viscous damper to reduce torsional vibration over the full speed range. A hydraulic



Side elevations of four-coupled and six-coupled diesel-hydraulic shunting locomotives of same power and weight, showing Rolls-Royce engine and torque converter inclined at 13 deg.



Four-coupled diesel-hydraulic shunter, showing sliding side and other cab windows giving good vision

governor is fitted as an integral part of the fuel pump unit.

All valves have stellited tips and seat faces in the cylinder head to minimise wear. Centrifuge primary and heavy duty oil bath secondary air cleaners specially developed by Rolls-Royce Limited are employed. Electric starting is by C. A. V. axial type motor.

Dry Sump Lubrication

Because of the inclined installation of the engine a dry sump lubrication system has been adopted, insensitive to any railway gradient. A heat-exchanger type oil cooler is fitted, also full-flow oil filters.

The Rolls-Royce radiator and power unit are mounted together on a three-point resilient suspension with the radiator vertical. Power is transmitted to the final drive gearbox through a Layrub flexible shaft.

The fan for the radiator, the 24 V., 480 W. auxiliary generator, compressor, and converter fluid charging pump are all belt driven from take-off points at the free end of the engine.

Three-Stage Torque Converter

The Rolls-Royce torque converter is a hydraulic power transmission unit built under licence from the Twin-Disc Clutch Company, U.S.A. Within its operating range this automatically varies the output torque to suit the load applied. The converter incorporates three stages of turbine blading between which are interposed two stages of fixed stator blading to re-direct the fluid. The fluid is pumped round the circuit by an engine-driven, centrifugal impeller which is maintained at near-constant speed for any speed of the turbine. The reaction of the fluid on the turbine blades produces a torque at the output shaft, when stalled, of the order of five times the input torque.

A single-plate, dry disc type clutch is fitted in order to disengage the drive between engine and impeller. The clutch is of the over-centre type which will remain in either the fully-engaged or fully-disengaged positions.

Dissipation of heat generated in the operating fluid during certain conditions of operation is by heat exchanger to the engine cooling system. Circulation of the fluid through the heat exchanger is achieved by the pressure differences which exist in the converter casing between the impeller inlet and outlet points.

The final drive gearbox gives an overall reduction of 11·5:1 through spiral bevel and straight spur gearing.

The reaction link between the gearbox and the frame has resilient connections to absorb shocks which would otherwise be transmitted through the gears. A spiral bevel pinion on the primary shaft is in constant mesh with two spiral bevel wheels, one of which is normally engaged with the layshaft by a sliding dog clutch to determine the direction of travel. The dog clutch slides on the splined layshaft and is operated by two air diaphragm cylinders mounted on the top cover of the gearbox. There is also a spring toggle device to hold the dog in mesh when the air supply is cut off. A neutral lock position is incorporated to disengage the drive in order that the locomotive may be towed. The gearbox casing is of fabricated construction split across the axle centre. The gears are splash lubricated from the sump formed by the lower half.

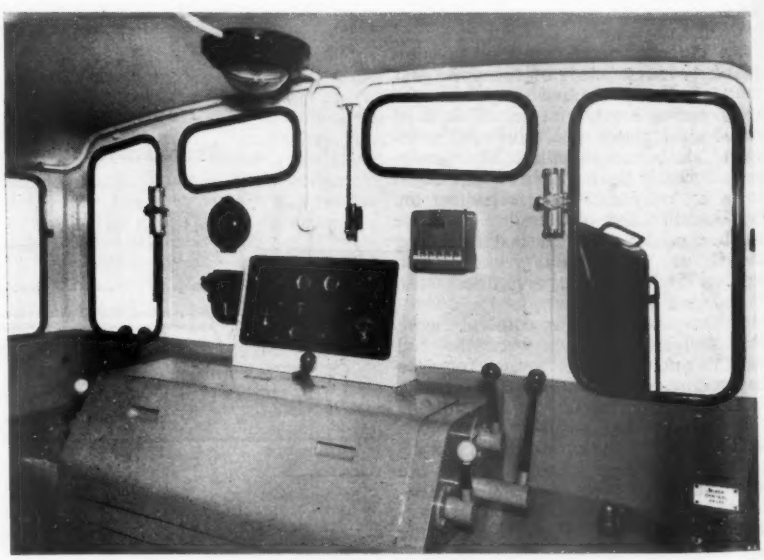
The unusual drive arrangement makes possible a short bonnet and cab with floor unobstructed by any form of jack-shaft gear casing.

Control System

The Rolls-Royce three stage torque converter provides a continuously variable torque output throughout its range which is stated to be sufficiently wide to provide ample range of tractive effort and speed for a shunting locomotive of this type. without the necessity of incorporating a change-speed gearbox or several converters operating over different speed ranges.

These factors necessitate a minimum of control levers and enable the driver to concentrate on shunting operations. The engine hydraulic governor control arm is mechanically linked to the throttle lever in the cab, giving

(*Continued on page* 742)



Cab, showing duplicated throttle, reverser, sanding and air brake levers. The single neutral/drive lever is immediately below instrument panel

Three-Hundred-Mile New Construction by the C.N.R.—2*

Second section, St. Félicien-Chibougamau, through rough country in Northern Quebec

A 7½-ton shot of dynamite moving 30,000 cu. yd. rock excavation for a cutting in Cran Valley. Note mountainous nature of country

THE second section of the construction in Northern Quebec from St. Félicien, near Lake St. John, to Chibougamau, or rather to a point known variously as Chibougamau Lake or Cache Lake, a few miles short of Chibougamau itself on the Beattyville-Chibougamau line, is 133 miles long. Except for the first 15 easy miles out from St. Félicien, this traverses considerably rougher country than does Section (*a*), described in the first part of this article.

Here again the clearing, formation earthwork and draining were done by contract in two sections, (1) the first 66 miles from St. Félicien already completed, and (2) the remainder, for which the contract was not let until 1957. On Section (1) about 50 miles of permanent-way and bridgework have also been finished. The whole line is expected to be opened during the latter part of 1959.

The permanent way is similar to that on Section (*a*) from Beattyville, except that 80-lb. rails were laid over the first 40 miles. The ruling gradient is 1 in 80 and the sharpest curvature is 4 deg. or about 22 ch. There are 14 bridges with spans of up to 196 ft. 10 in. and some of them of considerable height. Similar difficulties due to climate, black-fly and muskeg were experienced, and the formation required the excavation of a number of deep rock cuttings and the construction of high banks. Blasting shots (for the excavation) of up to 7½ tons of dynamite were used, and one of the illustrations shows the firing of one such shot. So effective was it that it moved 30,000 sq. yd. of rock and overburden in the excavation of a cutting in the Cran River area. This was made possible by drilling a great number of holes to a depth of no less than 21 ft. with the aid of mechanical drillers used to plant the sticks of dynamite; another illustration shows these drillers at work and the formation or grading in the background. Incidentally both these illustrations give a good general idea of the type of heavily-forested and broken terrain encountered on Section (*b*).

* Part 1 appeared in our issue of December 12

Bridgework

The first bridge that had to be built was within two miles of St. Félicien and was over the Salmon River. It consists of two through-type plate-girder spans each of 100 ft. The substructure, built by contract—in common with those of six other bridges in the initial 66 miles—was begun with a cofferdam for the pier, with the intention of founding it on the rock river bed. It was then found that this rock was of insufficient thickness for that purpose and rested on sand. Accordingly, 35-ft. sheet-piling was driven to enable concrete foundations to be carried down to an effective depth.

The largest bridge is being built to span the Cran River ravine, which has a bottom-width of 400 ft. and a depth of 100 ft. Two 196 ft. 10 in. spans were used, and the pier is 96 ft. in height above normal water level. Here again the river is fast-flowing, and a cableway 1,200 ft. between supports 140 ft. high was erected for the construction. It had a capacity of seven tons. As one of the illustrations shows, the pier was built in the form of three superimposed arches each 30-36 ft.

Mechanical drillers used to plant sticks of dynamite to depths of 21 ft. Note formation in background, also rough country in forest

Cran River Bridge under construction. Note the design of the 96-ft. pier and the cantilever method of girder erection with the aid of the cableway

high. This view also gives an excellent idea of the cantilever method of truss erection nearly 100 ft. above the river.

Of the other 12 bridges, one has one 196 ft. 10 in. and two 75-ft. spans; another has two 100-ft. spans, and several have 90-ft. spans, these latter being of the deck plate-girder type. The considerably more numerous bridges and rougher terrain on the St. Felicien line have inevitably made progress less rapid than on that from Beattyville, but much of the work, and particularly the bridging, on both lines had much in common. In this connection it may be noted that the special method used for bridge-girder erection briefly described in an editorial note in our issue of October 17, was used at several of the bridges.

Special Methods of Girder Erection

It may be remembered that basically a light Warren-truss pilot or launching span 5 ft. deep, was placed by crane across the 100 ft. gap between pier and abutment at a slope of about 1 in 10, one end being at about rail level and the other at bridge-girder bearing level. 101-ft. plate girders were lifted one at a time by the single crane and the outer ends of them placed on a trolley running on the top of the truss erection span whilst the crane lifted and moved forward the inner end, the trolley meanwhile running down the slope. The plate girders could be used as falsework for the erection of 196 ft. 10 in. truss spans where necessary. This method was used at the second crossing of Lake Opawica, for instance. The western part of the floor system of the 196 ft. 10 in. truss span was erected on steel falsework, but the remainder was built up on 101-ft. plate girders erected with a single crane and an inclined light erection-truss span as already described. This is only one of the methods adopted by the C.N.R. engineers for the erection of bridge girders with one crane.

The building of these new lines was under the general supervision of Mr. W. E. Griffiths, Chief Engineer, Central Region, C.N.R. The fieldwork was under Mr. G. H. Workman, Chief Engineer of Construction in that Region and was the direct responsibility of Mr. R. E. Oldham, Regional Construction Engineer. The bridges were designed by Mr. T. H. Jenkins, Bridge Engineer, and their construction was supervised by Mr. E. J. Napier, Regional Bridge Engineer.

(Concluded)

Diesel-Hydraulic Shunters for Industrial Lines

(Concluded from page 739)

almost instantaneous control of engine power.

Reversing is obtained through a dog clutch arrangement incorporated in the final drive gearbox. In order to obtain a very rapid reverse involving a minimum of effort on the part of the driver, the reversing mechanism is air-operated. Two diaphragm cylinders are mounted on the gearbox and air pressure is applied to one cylinder or the other through a Pilotair valve. The control rod of the Pilotair valve is linked to the driver's reversing lever, which is so arranged that its position indicates the direction of travel which is selected.

The locomotive must be completely stationary and the throttle lever in the idling position before the reverser can be thrown, but it is not necessary to select neutral. A mechanical interlock between the throttle and reverser ensures that the engine must be idling before reversing can take place. The reversing lever is normally locked in either extreme position when the locomotive is moving, and this lock can only be released when air pressure is applied to the lock release cylinder.

When the locomotive is stationary the driver depresses either foot operated pilot valve which operates the Relayair valve and allows air pressure to pass to the lock release cylinder. The overcentre clutch which breaks the drive between the engine and converter is mechanically operated from the cab. It is only necessary to select neutral when starting up, testing the engine, or when requiring to stand with the engine idling for more than a few minutes.

Sub-contractors include:—

Complete power installation including radiator	Rolls-Royce Limited
Electric starter	C.A.V. Limited
Dynamo	Simms Motor Units Limited
Air brake equipment and pneumatic controls	Westinghouse Brake & Signal Co. Ltd.
Layrub transmission coupling	Laycock Engineering Limited
Spiral bevel gears ..	David Brown Industries Limited
Buffers	Turton, Platts & Co. Ltd.
Roller bearing axleboxes	British Timken Limited
Heater	Clayton Dewandre Co. Ltd.
Engine air cleaner ..	Air-Maze Limited
Battery	D.P. Battery Co. Ltd.

NEW YORK SUBWAY TUNNELS TO BE CLEANED.—The walls of the tunnels of the underground railways of the New York City Transit Authority are to be cleaned by four machines spraying a mixture of detergent and water.

ELECTRIC RAILWAY TRACTION SECTION

Maintenance of Electric Motive Power

AS the first example of all-electric main-line working in Britain, the Manchester-Sheffield-Wath 1,500-V. d.c. electrification has enabled a fund of experience to be amassed which for the most part will be applicable to the conditions of 50-cycle traction. Maintenance of d.c. traction and auxiliary machines, and of mechanical parts, will still form the basic work on which the specialised requirements of the a.c. equipment will be superimposed, and the procedures and practices which have been evolved on the Pennine system since 1954 will repay study. A paper entitled "Maintenance and Overhaul of Electric Locomotives and Multiple-Unit sets of the Manchester-Sheffield-Wath Electrification" was presented to the Institution of Locomotive Engineers in London on December 10 by Mr. J. S. Scott, Works Manager, Gorton Locomotive Works, and Mr. J. K. Lord, Electric Traction Engineer, British Railways, Manchester. A general review of the work carried out at the Reddish depot and the Gorton electric locomotive repair shops was given in our April 12, 1957, issue in an article by Mr. Scott, and several special procedures referred to therein were dealt with at greater length in the paper. Among these is the ultrasonic testing of locomotive bogie axles which is carried out at each periodical repair. The apparatus used generates ultrasonic vibrations by the application of electrical impulses to a barium titanate transducer in the probe. On being reflected back to the probe by a boundary or flaw in the specimen under test, the vibrations are reconverted to electrical impulses and used to deflect the trace of a cathode ray oscilloscope. The position of such a deflection, as observed on the trace, is directly proportional to the distance of the flaw from the probe, in the specimen.

Another apparatus, which has been developed at the works, checks the adhesion of the whitemetal linings to the non-ferrous shells of traction motor suspension bearings in locomotives and motor coaches. Operating on the resistance bridge principle, the set detects lack of adhesion by the deflection of a galvanometer needle caused by the unbalancing of the bridge circuit when a suspension bearing with this defect is connected to the apparatus.

A high rate of brush holder wear has been observed, particularly in the motors of multiple-unit stock, and experiments with brazing to make good the wear in brush holder slots have proved successful to date, while a jig has been manufactured for slotting and broaching new or reconditioned holders. The authors direct special attention to this problem because of the large numbers of such holders coming into use on British Railways with the spread of electrification. Commutator re-turning has not proved excessive, but it has been found advantageous to develop a machine for recutting commutator slots rather than to rely on an operator's dexterity with a hand-manipulated power tool. On the mechanical side, the installation at Reddish of a tyre profile truing machine to do this operation with the tyres in situ, and the provision of rail lubricators on curves, reflect practices on which favourable reports were presented during the recent International Railway Congress in Madrid. The type of rail-level tyre reconditioning machine now being ordered by British Railways for installation in maintenance depots was described in our issue of October 10, 1958.

The author's suggestions for improvement and increased availability are of special interest, particularly the preference stated for springborne rather than nose-suspended motors. Fully-sprung suspension is being adapted in the new a.c. locomotives, but has not been used here before in regular service and has tended hitherto to be regarded as an unnecessary refinement. Roller suspension bearings for motors are also proposed, a practice now being introduced in certain Southern Region stock, and followed also in some of the diesel-electrical locomotives built under the modernisation plan. The recommendation that resistance compartments should be forced-ventilated rather than rely on natural ventilation through openings in the floor plates, which allow the entry of dust, mainly concerns d.c. practice. It would have its interest for a.c. traction if it were decided to introduce rheostatic braking, and recalls the compact resistor-blower assemblies now being installed for this purpose in some Continental-built locomotives.

Converter Locomotives in Hungary

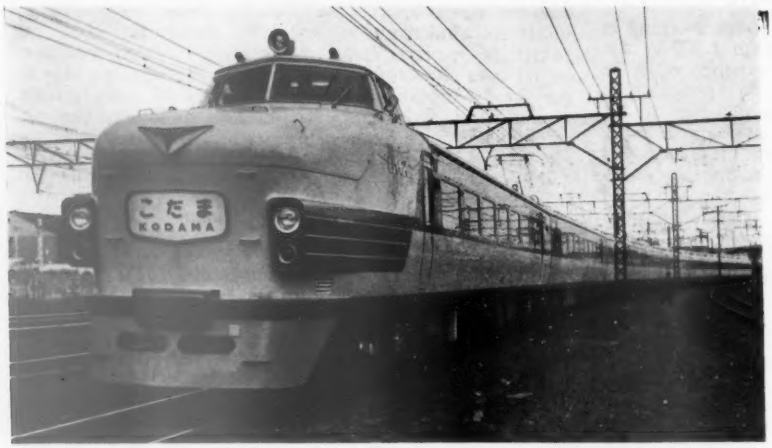
AFTER 25 years of industrial-frequency traction by phase-conversion in various forms, the Hungarian State Railways are reported to be turning to the a.c./d.c. system. Locomotives and motor coaches placed in service during the past two years have been equipped with rotary-converters feeding d.c. traction motors, and savings in weight have been achieved in spite of the fact that the d.c. motors are heavier than the induction types used previously. The first locomotives for the Budapest-Hegyeshalom electrification, opened between 1932 and 1934, had a single slip-ring motor with rod drive, fed from the 16-kV. overhead line through a rotary phase-converter. A liquid resistance controlled the acceleration, and the motor ran at any of four fixed speeds by pole-changing. The rod drive limited the maximum speed to 62 m.p.h., and in 1939 a more flexible system was sought by using individual axle drive. This made pole-changing motors impracticable because of their size, and so a rotary frequency-changer, fed from the phase-converter, was arranged to supply five different frequencies to the squirrel-cage traction motors. A 2-Do-2 locomotive of this type was built and tested in 1943, but the war prevented further development.

A modification of this system was used in the post-war Bo-Co locomotives, differing mainly in that the frequency-converter was direct-driven from the phase-converter instead of having its own motor, and in the use of slipring traction motors with a liquid control resistance. All these systems are variants of the basic Ganz-Kandö principle, but in 1939 a frequency-changing system with Ward-Leonard control of the rotor speed had been patented by Dr. Ratkovsky of Ganz and applied in a motor coach, so anticipating by over ten years the similar principle used in the 12 single-phase/three-phase locomotives built for the S.N.C.F. Valenciennes-Thionville electrification. It is not surprising that the latest development has been to use the continuously-variable d.c. output from a Ward-Leonard set to drive the traction motors themselves instead of retaining the frequency-changer and a.c. motors. Previously the idea of using induction machines for traction had been pursued tenaciously, even at the expense of complication. In spite of present trends in a.c./d.c. conversion, it would be premature to consider that the three-phase induction motor, or for that matter the single-phase series motor, is on the way to final disappearance from the traction field. Research may yet provide variations of the familiar forms of these machines which will justify the effort devoted to their development for railway purposes.

LIGHTWEIGHT ELECTRIC LOCOMOTIVE.—The S.N.C.F. recently brought into operation a new lightweight mixed-traffic electric locomotive for use on 25kV. electrified lines in the Northern and Eastern Regions. These locomotives were built by the Alsthom. They have a maximum speed of 53 m.p.h. in goods service and 87 m.p.h. in passenger service. There are two traction motors, fed by ignitron-type rectifiers, each developing 1,750 h.p. at 770 r.p.m. The tare weight is 68 *tonnes*.

Multiple-Unit Electric Stock for Japanese National Railways

Eight-car trains for Tokyo-Osaka high-speed service



Eight-car multiple-unit electric train "Kodama" on its inaugural run between Tokyo and Osaka

MULTIPLE-unit electric trains have been placed in service by the Japanese National Railways on the Tokaido main line, which connects Tokyo and Osaka. This 344-mile section is electrified at 1,500 V. d.c. The trains, named "Kodama" (Echo) complete the journey between the two cities in 6 hr. 50 min. The service was inaugurated on November 1, 1958.

They are operated in both directions twice daily leaving Tokyo and Osaka at 7 a.m. and arriving at 1.50 p.m.; the return departure is at 4 p.m., from both cities with arrivals at 10.50 p.m.

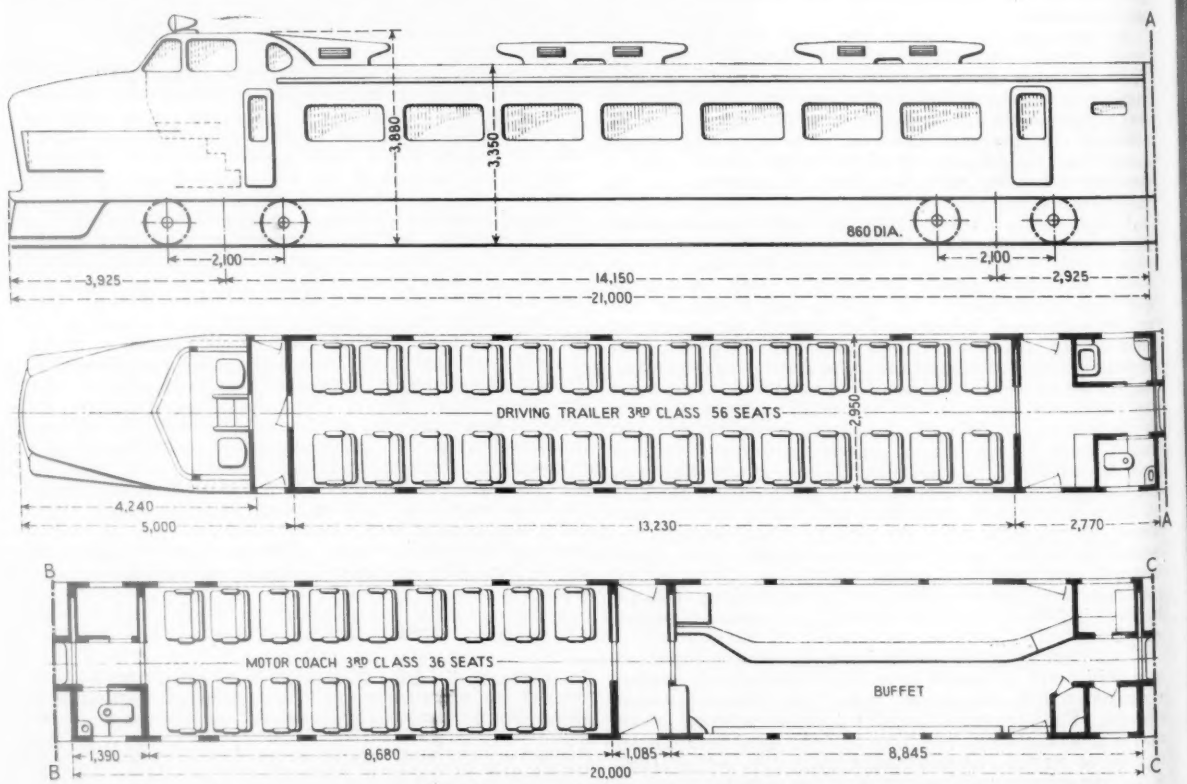
Three train sets have been built, two to operate the service and one as a reserve. They were built by three different manufacturers; Kawasaki Sharyo, Kinki Sharyo, and Kisha Seizo.

Train Construction

One train consists of two identical four-car units coupled back to back. Each four-car unit includes a driving trailer, third class, seating 56 passengers; a power car, third class, seating 68; a power car, third class with buffet, seating 36; and a trailer coach, second class, seating 52. All vehicles are of the open saloon type.

The driving cab is situated in an elevated dome-like structure just behind the equipment compartment at the front of the driving trailer. Two wide front windows give good clear visability.

A motor-generator of 150 kVA. output and an electrically-driven air compressor of 3,000-lit./min. capacity are fastened down in the equipment compartment through rubber blocks. These supply one four-car unit, but their capacities suffice for a six-car set as



Elevation and plan of driving trailer, showing elevated cab; (below) plan of motor coach, showing layout of buffet

12-car trains are expected to be placed in service at a future date.

Each coach has an electro-pneumatic sliding door on each side. All side windows are double-glazed fixed type. The coaches are air-cooled during summer months by unit coolers installed in the roof. During the winter, heating is provided by electric heaters installed underneath the seats. Ventilation is by positive and suction ventilators installed on the roof and exhaust fans at both ends of the coach.

To minimise noise rubber is used between body and underframe. The body itself is sprayed with fibre glass and asbestos. This also provides heat insulation.

Interior Design

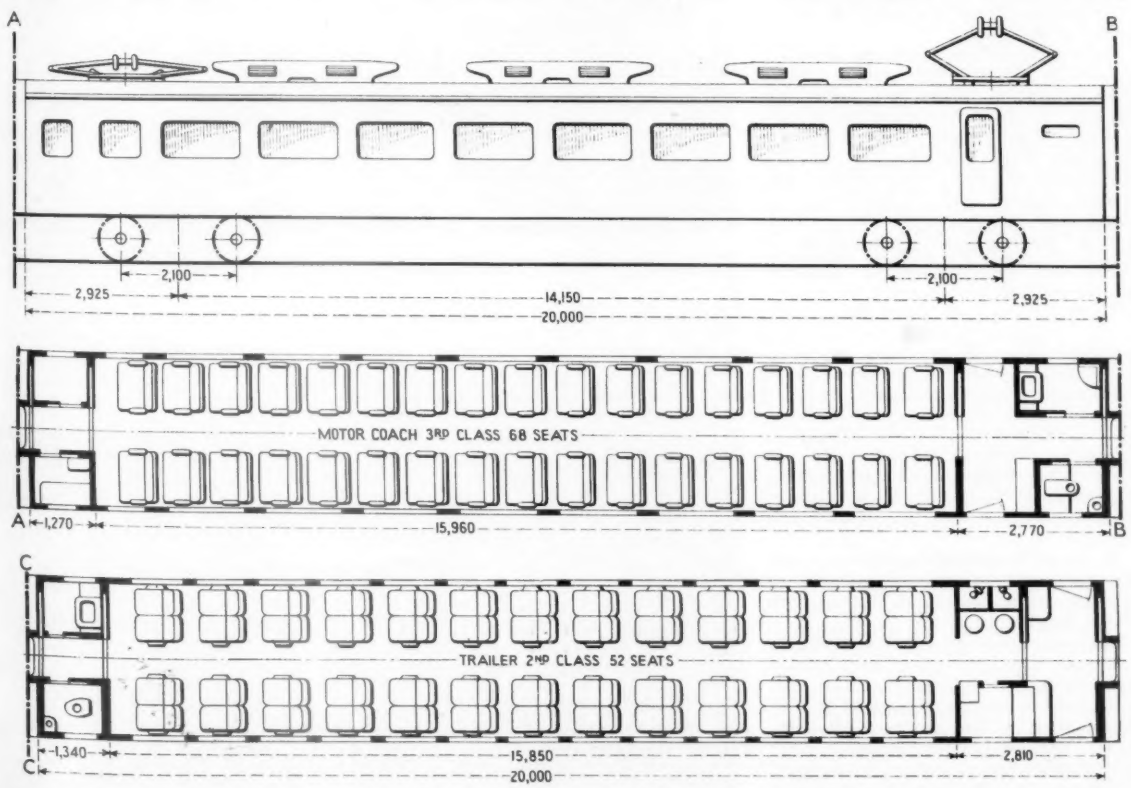
Aluminium sheet with a bonded plastic surface is used for the interior finishing. This is fixed to the body through wooden blocks. The ceiling is covered with a perforated sound-absorbing board, and finished with the plastic-covered aluminium sheet.

Each coach has double seats, on either side of a centre gangway. The second class seats can recline independently of each other and swivel round to face the opposite direction. In the third class coaches the seats do not recline, but each pair can be turned to face the opposite direction. The floor is covered with carpet in the second class coach, and with linoleum in the third class coach. A small writing desk is installed in either corner at one end of the second class coach. The buffet contains a serving counter, electric refrigerator, hot-water heater, sink and cupboard. There is also a rest room for the salesgirls who serve refreshments throughout the train. A speedometer is fitted on the wall in the buffet for the benefit of the passengers.

Buffet in motor coach, showing speedometer on wall and view through to third class saloon

The toilet room of each coach is equipped with an electric hot-water heater and a drinking-water cooler combined with a steriliser. A light-alloy water tank is mounted under the floor and supplies the wash basin and toilet. The drinking-water cooler is supplied from a separate small tank also mounted below the floor.

Interior lighting is by 40-W. fluores-



Elevation and plan of third class motor coach, showing twin pantographs ; (below) plan of second class trailer

Trailer bogie, showing disc brakes and journal coil springs

cent lamps in two rows down the centre of each coach. The vestibules are also equipped with 40-W. tubes, but the toilets and conductor's room have 20-W. tubes.

The motor generator, in the driving trailer, supplies three-phase 60-cycle a.c. at 440 V. to each car of the four-car unit. The load is distributed at three working voltages for the different circuits: 440 V. for the unit cooler and rectifying apparatus; 250 V. for coach heaters, hot-water heater, and 40-W. fluorescent lamps; and 100 V. for the drinking-water cooler, sterilising lamp, exhaust fan, 20-W. fluorescent lamps, incandescent lamp, and electrical equipment in the buffet.

In a corner of the buffet car there is a telephone booth, which provides direct communication with the public exchange by ultra short-wave radio telephone. The second class seats are equipped with earphones for receiving any one of two radio programmes. The master receivers are installed in the conductor's room.

The main electrical equipment is mounted under the floor of the third class power car. All axles of each power car are motored, making eight motors to each four-car unit. No equipment other than car motors is mounted in the buffet power car.

The bogies of both power and trailer cars are of welded construction incorporating coil springs for the journal boxes and air springs for the bolster. Dynamic braking is used for the power car, and pneumatic braking is fitted as an auxiliary. A device is fitted which raises the brake ratio for high-speed braking and reverts to the normal ratio for low speed braking. The trailer cars are fitted with disc brakes, two discs to each axle.

The tare weight of each coach is as follows: driving trailer, 34 tons; power car, 38 tons; power car with buffet, 34 tons; trailer, 30 tons.

The main characteristics are as follow: —

One-hr. rating for one unit output ..	775 kW.
Tractive effort (35 per cent weak field)	5,510 lb.
Speed (35 per cent weak field) ..	72 m.p.h.
Maximum running speed	75 m.p.h.
Traction motor output	100 kW.
Gear ratio	22 : 77

Interior of third class coach. Note roof ventilators and plastic panelling

Long Welded Rails in Malaya

AMONG the track improvements in progress by the Malayan Railway under its modernisation programme started in 1954, is the introduction of long welded rails on the metre-gauge system.

A rail welding depot has been brought into use and standard 60-ft. lengths of rail are being flash-butt welded into 480-ft. lengths.

The accompanying illustration shows a special train conveying long welded rails from the welding plant to site. Shop welding and conveying to site by special train is the method most commonly used for the installation of long welded rails, and is used extensively by administrations throughout the world. It is reported that thermit welding *in situ* is being carried out in Malaya.

Special train conveying long welded rails in 480-ft. lengths

New Equipment for 50-Cycle Locomotives

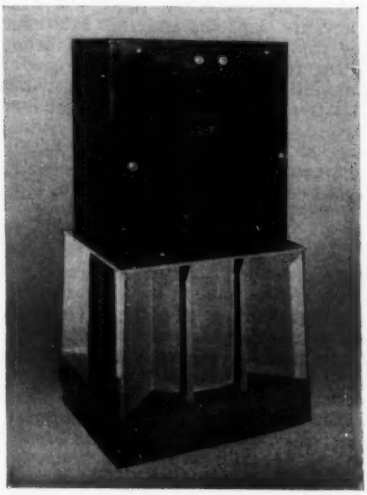
Smoothing chokes and magnetic amplifiers in motive power for the Belgian Congo

A NEW and compact design of smoothing choke for use in rectifier locomotives operating on 50-cycle supplies has been developed by the Ateliers de Constructions Electriques de Charleroi (A.C.E.C) and is being incorporated in the series of 10 75-ton Bo-Bo locomotives of 2,040 h.p. which the company is supplying to the Bas Congo-Katanga Railway. By a special technique of construction, using steel wires in the core and windings of bare, edge-wound copper strip, the improvement in the magnetic circuit and in the use of the copper has enabled the weight of an installation for a four-motor locomotive to be kept down to a little under 12 cwt. The four chokes for such a locomotive are mounted in a single block and are forced-ventilated by a fan incorporated in the base of the assembly. Each choke has an inductance of 4·2mH. at 750A. d.c.

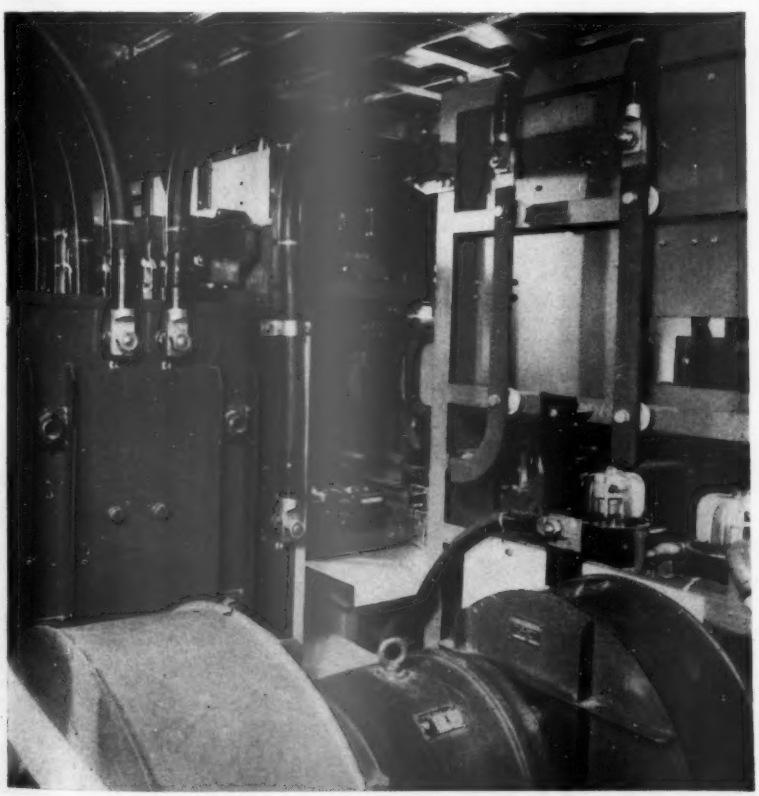
Rheostatic Braking

The above locomotives are also being equipped with constant-power rheostatic braking under magnetic amplifier control. This system has already given satisfactory results in service in the Class "2200" Bo-Bo locomotives with 50-cycle motors supplied to the Bas Congo-Katanga Railway by A.C.E.C. some two years ago, in which this static form of control replaced the rotary amplifier type of exciter used in the Class "2100" locomotives of 1952 for the same railway.

As applied in the Class "2200" locomotives, the magnetic amplifier controls the excitation of No. 4 traction motor, which during rheostatic braking acts as exciter for the fields of the other three motors connected in series across its output. As shown in the diagram, excitation for No. 4 motor is taken from the line through transformer T, the secondary of which is connected in a full-wave rectifier circuit supplying d.c. to the motor field. Magnetic amplifier windings X and Y have rectifiers in series with them so as to carry current on alternate half-cycles, and their impedance depends on the d.c. in the control windings, Z1 and Z2. This current reflects the difference between a selected reference voltage tapped off a potentiometer across the locomotive battery, and a voltage derived from a tapping on the braking resistor of motor No. 3. If, during rheostatic braking, the output from the exciter motor tends to fall as a result of a change in speed of the train, the braking current, also, will try to decrease, but the change in the relative potential of the battery potentiometer and braking resistor tappings will be such as to increase the current through the control windings. This reduces the power winding impedances so that more current is drawn from the line for excitation of motor No. 4, compensating for its lower speed of rotation. A rise in speed produces the reverse effects. The response of the equipment to incipient changes is rapid and sensitive, and it is the production of large changes in excitation current by the small variation in the ampère-turns due to the control windings, which causes the system to be described as a form of amplifier.



Assembly of smoothing chokes and motor-driven fan for rectifier locomotive



Interior of rectifier locomotive showing smoothing choke in left foreground, behind motor-blower set

Magnetic Amplifier

The magnetic amplifier equipment, consisting of the saturable reactors, transformers and rectifier networks, is mounted on a panel located inside the locomotive in the corridor connecting the two driving cabs. Here it is conveniently accessible for inspection, although the absence of moving parts and relays results in ordinary maintenance requirements being negligible.

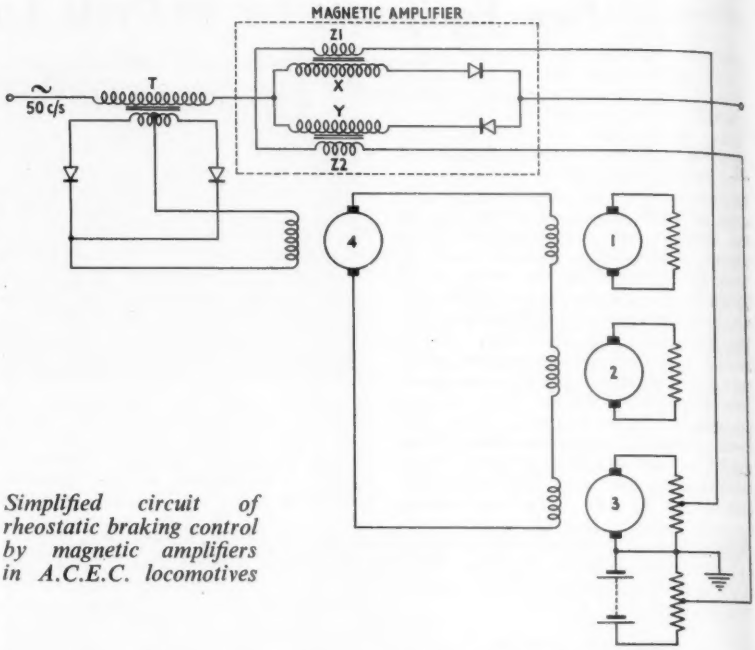
The reason for adopting the scheme described was the need to restrict the

amount and weight of equipment, and the size of the braking resistors, to limits imposed by the space available inside the locomotive. The latter requirement has been met by arranging that at all speeds the resistances dissipate the maximum power of which they are capable, and this is attained by passing a constant current through them from the three motors used as braking generators in the manner described. Three values of reference voltage can be selected on the controller, so that three different braking characteristics are obtained, covering speeds between 22 and 40 m.p.h.

Amplifier Windings

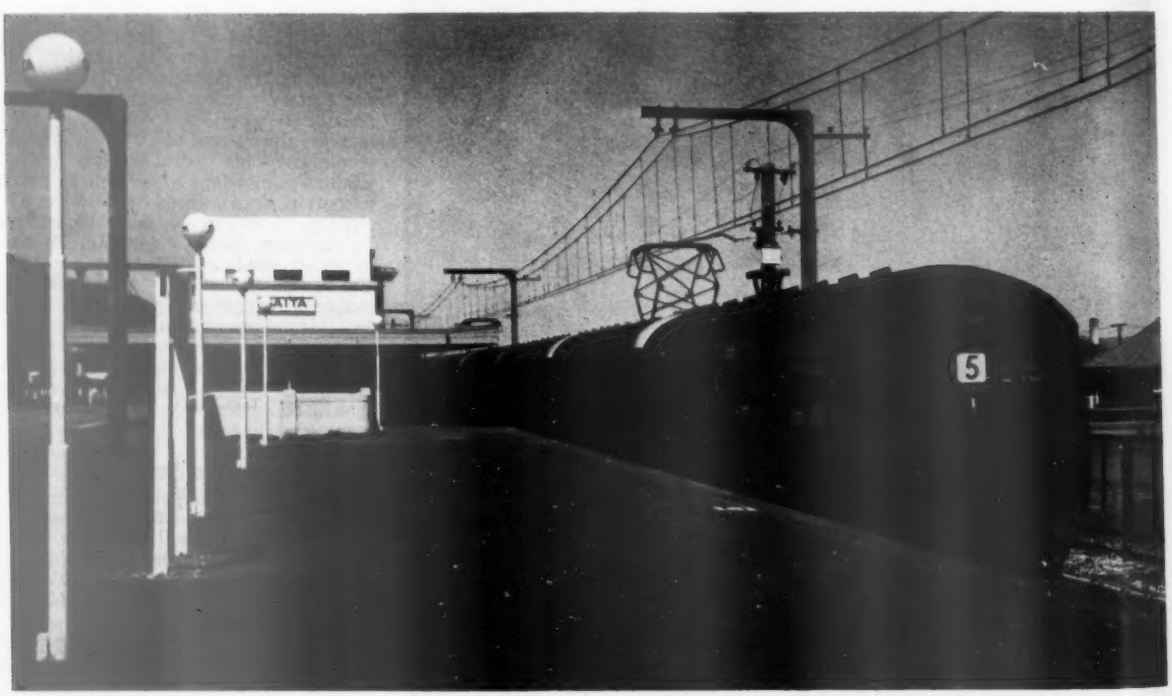
Besides the arrangements shown in the simplified circuit diagram, the magnetic amplifier incorporates bias and anti-hunting windings. The latter exercise a limiting effect when rheostatic braking begins and the control windings are subject momentarily to the battery potentiometer voltage alone. Excessive swings in the excitation of motor No. 4 before the normal braking voltage has built up are thus avoided.

The three resistance elements are housed inside the equipment compartment in a casing which incorporates a motor-driven fan for forced ventilation. The motor is supplied from a tapping on one of the resistances so that the power required for ventilation is derived from that supplied by the electric braking. Ventilating air is drawn from inside the locomotive body and exhausted, after passing over the resistances, through the floor.



Simplified circuit of rheostatic braking control by magnetic amplifiers in A.C.E.C. locomotives

Electric Traction in New Zealand



Six-coach multiple-unit electric train, built by the English Electric Co. Ltd., at Taita Station, in the Wellington suburban area. The station serves a new residential area and was rebuilt when the line was electrified at 1,500 V. d.c.

RAILWAY NEWS SECTION

PERSONAL

Mr. E. J. Borron, Commercial Assistant to the General Manager of the Nyasaland and Trans-Zambesia Railways, has been appointed the first representative of those systems in Rhodesia. (See editorial reference this week.)

We regret to record the death on December 9, at the age of 90, of Mr. Edwin C. Cox, C.B.E., M.V.O., T.D., Traffic Manager, Southern Railway, from 1930 to 1936. Mr. Cox joined the South Eastern Railway in 1883, and after training for three years, was transferred to the office of the Outdoor Superintendent. In 1902 he was appointed Assistant Indoor Superintendent of the combined South Eastern and Chatham system. He became Assistant Superintendent of the line in 1910, and Superintendent of the Line in 1911. Mr. Cox was a member of the committee appointed to control the supply of wagons for Government traffic from 1915 to 1919. He also assisted the Railway Executive Committee in dealing with transport of troops, munitions and stores in Britain. In 1919, 1920, 1926, 1931, and 1935, Mr. Cox was Chairman of the Railway Clearing House Superintendents' Conference. He was also Chairman of seven committees appointed to negotiate, with the trades unions, the standard rates of pay and conditions of service of traffic staff in the conciliation grades throughout the country. He was later a member of the panel of railway officers on the National Wages Board. Mr. Cox served on the committee appointed, in 1920, by the Minister of Transport to consider and report on automatic train control. On the formation of London Passenger Transport Board in 1933 Mr. Cox became a member of the Traffic Advisory Committee and the Fares & Services Committee. When the Southern Railway was formed, in 1923, Mr. Cox was appointed Chief Operating Superintendent and, in 1930, became Traffic Manager, the position from which he retired in 1936. He was a Foundation Member of the Institute of Transport and a former Member of Council of that body. He was awarded the gold medal of the Institute of Transport, in 1928.

The late Mr. Edwin C. Cox
Traffic Manager, Southern Railway, from 1930 to 1936

Sir John Elliot writes, in *The Times*

Edwin Cox, who has died in his 91st year, was one of the four men who devised and carried out the extensive electrification and modernisation of the Southern Railway in the 1920s and 1930s under the leadership of Sir Herbert Walker. The other three were George Ellson and Alfred Raworth, the Civil and Electrical Engineers respectively, and Gilbert Szlumper, then Assistant General Manager of the System. Raworth and Szlumper alone remain of that redoubtable team.

Cox, who started on the old South-Eastern as a messenger boy at London Bridge, was born with brains and courage in abundance. Without influence he rapidly made his way up the ladder, becoming Superintendent of the Line at an unusually early age. He remodelled the steam suburban services in South-East London with drive and foresight, but an unfortunate incompatibility with his chief, Sir Percy Tempest, nearly brought his career to an end.

With the formation of the Southern Railway in 1923, however, Cox found his real task in what proved to be a 14-year partnership with Walker, in a remarkable railway era south of the Thames filled with brilliant achievement. First the dense suburban services and then the main lines to all the South Coast resorts were electrified and completely remodelled, and quickly earned handsome dividends in spite of severe motor coach and motor car competition. When Walker retired in 1937 he said publicly: "I would never have done it without Cox."

"E.C.C.," who became Traffic Manager in 1930, in charge of all operating, commercial and continental services of the S.R. (a direct forerunner of the present regional traffic organisations of B.R.) was a tall handsome man of great vigour and the strongest character, who drove his team, of which the writer was one, mercilessly but surely towards the goals that he and Walker had planned together. Moreover, he knew and was known by thousands of S.R. men throughout the system, and those who recall him today will think of an upright man of deep religious conviction, a fine speaker, and a tireless public servant, who left a lasting mark on the railways of Britain in a way that few men have done before or since. Their thoughts will also go to his widow, herself a remarkable woman now in her 94th year, his devoted partner through all his years of achievement and happy retirement.

The following have been nominated by the Council of the Institution of Locomotive Engineers to fill the vacancies occurring at the end of the present session, May 31, 1959: President, Mr. R. A. Smeddle; Vice-Presidents, Mr. J. F. Alcock and Mr. A. W. Manser; Ordinary Members of Council, Messrs. E. H. Baker, G. S. Bingham, E. R. Brown, J. H. Cansdale, T. T. Lambe, E. J. Larkin, S. I. White.

The following changes of directors of the Swansea & Mumbles Railways Limited and the Mumbles Railway & Pier Company have taken place, resulting from the share purchase offer of the South Wales Transport Co. Ltd., which became unconditional on October 28: Mr. R. K. Bellingham, Mr. H. Douglas Jones and Mr. J. H. Williams have resigned; Mr. W. T. James, Mr. W. N. Dravers and Mr. T. V. Woods have been appointed.

We regret to record the death, on November 30, of Mr. Robert Martin, Chief Rates Clerk of the former Great Northern Railway Board, Ireland. Mr. Martin began his railway career with the Great Northern Railway in 1916. He was appointed to the Traffic Manager's Office in 1931 and later became Chief Commercial Representative. He was appointed Chief Rates Clerk in 1956. As a result of the merger of the Great Northern Railway Board with the Ulster Transport Authority, on October 1, Mr. Martin continued his services with the U.T.A. Mr. Martin was a member of the Transport Officials Club and the Institute of Transport.

Argentine Railway Appointments

The following appointments are announced by the Argentine National Railways:—

General San Martin Railway

Mr. Justo G. Hazeldine as Chief of Traffic Department.

Eng. Bernado Schwartz as Chief of Mechanical Department.

D. F. Sarmiento Railway

Eng. Francisco Llusá as Acting Chief of Way & Works Department.

General Urquiza Railway

Mr. Jose Bajraj as Chief of Supply Department.

General Rocca Railway

Eng. Roberto F. Rodriguez as Chief of Mechanical Department.

Mr. N. L. Collins

Appointed Trains Assistant, Southern Region

Mr. F. P. B. Taylor

Appointed General Assistant, Southern Region

Mr. J. D. Atkins

Appointed Passenger Assistant, Southern Region

Mr. N. L. Collins, A.M.Inst.T., District Traffic Superintendent, Exeter, Southern Region, British Railways, who, as recorded in our October 24 issue, has been appointed Trains Assistant in the office of the Assistant General Manager (Traffic), began his railway career with the South Eastern & Chatham Railway in 1911. After training in Kent, he joined the Northern District Superintendent's staff in 1913 and in 1924 became a member of the Divisional Operating Superintendent's staff at Dover. In 1930, when the Divisional offices were re-organised, Mr. Collins became a member of the London (East) Divisional Superintendent's staff, London Bridge. In 1935 he became Senior Relief Stationmaster for the London (East) Division, and in 1939 took charge of the rail communications to and from Woolwich Arsenal. Mr. Collins was appointed Assistant for Freight Working to the London (East) Divisional Superintendent in 1940. In 1941 was made Assistant to the London (East) Divisional Superintendent for Rules & General Subjects, and, in 1942, Assistant for Commercial Purposes. In 1944 he moved to Southampton as Assistant Divisional Superintendent, Southern Division, in connection with traffic for D Day and subsequent operations. At the end of the war, Mr. Collins became Commercial Assistant, Southern Division. He was appointed Senior Assistant Divisional Superintendent, Orpington, in 1947, and District Traffic Superintendent, Exeter Central, in 1952. Mr. Collins is Past-President of the Western Section of the Institute of Transport, and a Director of the Southern and Western National omnibus companies.

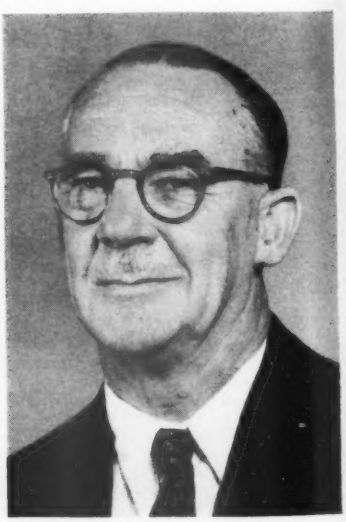
Mr. F. P. B. Taylor, A.M.Inst.T., Assistant (Services & Finance), General Manager's Office, Southern Region, British Railways, who, as recorded in our October 24 issue, has been appointed General Assistant in the Office of the Assistant General Manager (Traffic), was educated at Churcher's College, Peterfield, and joined the Southern Railway at Leatherhead Station in 1928. He was selected as a Cadet in 1929 and had four years training in all departments, followed by further experience in the Docks & Marine Department, Southampton, and in the Development Section of the Traffic Department, Waterloo. In 1937, Mr. Taylor was appointed to the Business Systems Section (Office Methods, Mechanisation & Equipment) of the General Manager's Office. In 1942, he was Chief of the Air Raid Precaution Section and, in the following year, Chief of the General Section. In 1946, he was appointed Assistant (Services & Finance) and also occupied the position

Mr. G. H. Baillie

Appointed Vice-President, Operations, Canadian Pacific Railway

Mr. S. M. Gossage

Appointed Vice-President, Eastern Region, Canadian Pacific Railway



Mr. E. G. Lampard

Westinghouse Brake Engineer, New South Wales Railways, 1933-58

of Secretary at the Traffic Officer's Conference. Subsequently Mr. Taylor was closely associated with all the changes and readjustments brought about by Nationalisation, reorganisation and the new fares and charges schemes.

Mr. J. D. Atkins, Traffic Development Assistant to the Chief Commercial Manager, in the office of the Assistant General Manager (Traffic), Southern Region, British Railways, who, as recorded in our October 24 issue, has been appointed Passenger Assistant, Office of Assistant General Manager (Traffic), joined the South Eastern & Chatham Railway, at Swanley Junction Station, in 1912. After experience in all branches of station working at many stations, he moved to the Office of the Superintendent of the Line in 1922. In 1924, he joined the Passenger Fares Season Ticket Rates Section, Indoor Commercial Manager's Office, Southern Railway. In 1934, he became Chief Excursion Clerk, Divisional Superintendent's Office, Exeter Central. In 1936, Mr. Atkins was promoted to be Chief Commercial Clerk in that Office, and in 1941 he was appointed to a similar position in the District Superintendent's Office, Redhill. From 1942 to 1948 he was Head of Section in the General Manager's Office Compensation Department. He was then appointed Deputy Road Transport Assistant to the Chief Commercial Manager. From 1951 to 1954, Mr. Atkins was Assistant District Traffic Superintendent, Redhill, and since 1954 has been Traffic Development Assistant to the Chief Commercial Manager.

Mr. George H. Baillie, Vice-President, Eastern Region, Canadian Pacific Railway, who, as recorded in our October 24 issue, has been appointed Vice-President, Operations, joined the C.P.R. at Montreal in 1918 as a clerk in the Vice-President's Office. Ten years later Mr. Baillie became Chief Clerk to the Vice-President, Western Lines, Winnipeg, and, later, was made Assistant to the General Superintendent, Vancouver. He became Assistant Superintendent at Lethbridge in 1934, and at Wynyard in 1936. He was appointed Superintendent at Vancouver in 1937, and at Revelstoke in 1941. He was promoted to be General Superintendent, Alberta District, with headquarters at Calgary, in 1942. Mr. Baillie returned to Vancouver, in 1944, as General Superintendent British Columbia District and, two years later, went to Winnipeg as General Manager, Western Lines. In 1947, a new operational organisation was set up, abolishing the former Eastern and Western Lines and creating three separate regions, Eastern, Prairie and Pacific. Mr. Baillie was appointed the first Vice-President, Pacific Region, and took over the Eastern Region in 1950. Mr. Baillie is President & Director of the Aroostook River Railroad Company; the Aroostook Valley Railroad Company; the Grand River Railway Company; the Lake Eerie & Northern Railway Company, and the Massawippi Valley Railway.

Mr. S. M. Gossage, Assistant Vice-President of Personnel, Montreal, Canadian Pacific Railway, who, as recorded in our October 24 issue, has been appointed Vice-President, Eastern Region, with headquarters at Toronto, is 53. Educated at Rugby School, England, Mr. Gossage later graduated B.Sc. at London University. He began his career with Canadian Pacific Railway in 1926, at Trois Rivieres, Quebec. During 1933 and 1934, he took his Master's Degree in Transportation, at Yale, on a Strathcona Fellowship in Transportation. Mr. Gossage was appointed statistician in the office of the Vice-President & General Manager, Eastern Lines in 1935, and was Assistant to that officer from 1941 to 1945. Since 1935 Mr. Gossage has been concerned with administration of wage agreements and participation in labour negotiations, both in the Operating and Personnel Department. In 1945 he was appointed Assistant Manager Personnel, Montreal, and became Assistant Vice-President of Personnel in August 1957. A Past-President of the American Association of Railroad Superintendents and of the Montreal Personnel Association, Mr. Gossage is also a former Chairman, Montreal Branch, Canadian Institute of International Affairs. He was an adviser to the Employer's Delegate to the International Labour Conference in 1954 and 1955.

Mr. E. G. Lampard, B.E., M.I.Loco.E., Westinghouse Brake Engineer, Mechanical Branch, New South Wales Government Railways, who, as recorded in our November 21 issue has retired, received his general education at The Kings School, Parramatta, New South Wales. During the 1914-18 war Mr. Lampard served in the Middle East and in Europe with the Royal Australian Flying Corps. In 1922, he graduated as a Bachelor of Engineering (Mechanical & Electrical) at the P.N. Russell School of Engineering, University of Sydney (N.S.W.). He joined the New South Wales Government Railways in 1923, and held various engineering positions in the Mechanical Branch, before specialising in the air brake engineering activities of the branch. Mr. Lampard later was appointed Westinghouse Air Brake Engineer. During the 25 years he held this position, he set up, throughout the system the organization, methods and practices for the maintenance of air brake equipment on all the locomotives and rolling stock. He devised special brake testing apparatus and a flowmeter device for indicating the train brake-pipe pressure. Mr. Lampard has given evidence on railway matters in the Supreme and District Courts of New South Wales. In 1939, he led a team of mechanical staff to the Bristol Aircraft Works in England. On his return to New South Wales, he was appointed Production Engineer for the manufacture of bomber and fighter aircraft. Later he took up his former position on the railways. Mr. Lampard took an active interest in the selection and training of candidates for railway mechanical engineering positions.

Mr. T. E. Steel, Chief Accountant, Ransome & Marles Bearing Co., Ltd., has been appointed Secretary. He succeeds Mr. F. Freeman, who has relinquished his position for health reasons.

Mr. Fred Walker, Methods Engineer, Fort Dunlop, Birmingham, Dunlop Rubber Co. Ltd., has been appointed manager, Overseas Engineering Department.

The Board of Trade announce that Mr. A. N. Halls, the Regional Controller, Midland Region, will be temporarily attached to the Headquarters Division of the Board of Trade dealing with the distribution of industry. He will have special responsibility for expediting action, throughout Great Britain, to promote industrial development in areas of high and persistent unemployment.

Mr. W. E. Redfearn has been appointed a director of the English Steel Corporation Limited with effect from January 1.

Mr. R. J. Ellery has been appointed to the board of the Devon General Omnibus and Touring Co. Ltd. Mr. T. R. Williams has resigned as a director.

Dr. A. J. Kesterton, Superintendent of Steel Production, Steel Division, Steel Company of Wales, Limited, will be taking up the appointment of Managing Director of Davy British Oxygen early in 1959.

We regret to record the death on December 8, at the age of 68, of Mr. P. L. J. Hands, formerly District Controller of Stores, Howrah, East Indian Railway.

Mr. W. D. Cartwright has been appointed Field Sales Executive, Steels Engineering Products Limited. He was previously Sales Manager, Auto-Truck Division, R. A. Lister & Co. Ltd.

Mr. S. C. Leslie has been appointed Consultant on Information Policy, both external and internal, of Associated Electrical Industries Limited. The appointment will take effect in February.

Mr. W. Forbes Ritchie, Chief Engineer of the Consolidated Pneumatic Tool Co. Ltd. has been appointed to the newly-created position of Manager of Factory Operations.

Mr. William Barr, Honorary Treasurer of the Iron & Steel Institute since 1953, has been nominated by the Council for Election as President of the Institute for the 1959-60 session. He will take office on May 6, 1959. Mr. Barr is a director of Colvilles.

Mr. B. Dawkins, Chief Assistant for Professional Recruitment & Electrical Training, Metropolitan-Vickers Electrical Co. Ltd., has been appointed Assistant Manager of the Education Department for Professional & Technician Apprentice Recruitment & Training.

G. A. Harvey & Co. (London) Ltd. announce the following appointments: Mr. K. Tardif, Publicity Manager, has taken over the duties of Home Sales Manager; Mr. H. Barker, Deputy Sales Manager, has been appointed Export Sales Manager, and Mr. H. F. Jones becomes London Area Manager.

Mr. J. R. Menzies-Wilson and Sir Frederick Scopes retire as Managing Directors of Stewarts and Lloyds Limited on December 31. They both remain on the board. Mr. Menzies-Wilson also remains Chairman of Stewarts and Lloyds of South Africa Limited and Stewarts and Lloyds Minerals Limited. Sir Frederick Scopes remains Chairman of Stanton Ironworks Co. Ltd. Mr. L. M. T. Castle, Director and Secretary, has resigned from his appointment as Secretary and has been appointed Managing Director, Finance & General Administration, his resignation and appointment to take effect from January 1. Mr. R. Otley becomes Secretary. Mr. G. H. T. Macleod, Deputy Secretary, has resigned that appointment and has been appointed an assistant secretary, and Controller General Administration, with effect from January 1. Mr. T. W. Tomlinson has been appointed an assistant secretary as from the same date.

NEW EQUIPMENT AND PROCESSES

Cutting Device for Hacksaw Machine

IN steel erection it is often necessary to cut steel sections of special shapes. For this and similar work the Fein portable hacksaw machine has been designed. Clamping devices enable it to be fixed to the work and to cut at maximum efficiency.

The accompanying illustration shows the electric 450-W. model cutting a 14-in. × 8-in. steel section projecting from an adjoining building. On this site, acetylene cutting was forbidden because of fire danger. The machine was clamped to the joists and left by the operator to work automatically.

The hacksaw incorporates a high-speed steel sawblade, which reciprocates at 480 strokes a min. Each stroke is 2½ in. in depth. The weight of the machine is 17½ lb. In normal application a 4-in. dia. pipe with ¼-in. wall thickness can be cut through cleanly in 3 min. Adjustment on the clamps also enables the machine to perform mitre cutting.

The cost of the electric single-phase AC/DC model is £72 and of the pneumatically driven model is £75. These prices are exclusive of clamps and blades. The manufacture of special clamps takes two to three weeks, but standard equipment is available for immediate delivery.

Further details may be obtained from the distributors, Trend Industrial Equipment Limited, 95 Dudden Hill Lane, London, N.W.10.

Surfaced Hardboard

A MELAMINE surfaced hardboard, ⅛ in. thick, is stated to be resistant to moisture, acids, alkalis, and heat. Applications include public rooms in stations, offices, and passenger rolling stock.

It is available in sizes 84 in. × 48 in. and 72 in. × 48 in. in a variety of colours. The price varies according to the quantities from 1s. 6d. to 1s. 7½d. a sq. ft.

Further details may be obtained from the manufacturer, the Edmonton Panel Co. Ltd., Angel Factory Colony, London, N.18.

Boxed Lathe Tools and Holders

FOR toolrooms in railway works or in development of prototypes or in railway apprentice schools, where inexpensive and efficient lathe work on small quantity runs is desirable, double-headed lathe tools in adjustable holders may be useful. These allow for precise setting and immediate rotation to bring a second cutter into use immediately the first needs regrinding. They are available in boxed complete sets for both external and internal turning.

Impero Unificatore equipment is claimed to allow for speediness, ease of handling, and the best use of tools for working hard materials such as steel, bronze, and cast iron when high cutting speed is necessary. The tool tips are made of shockproof cutting alloy which can be easily ground.

Further details, including price and delivery, are available from the distributors for the British Isles and the Commonwealth, A. A. Jones & Shipman, Limited, Narborough Road South, Leicester.

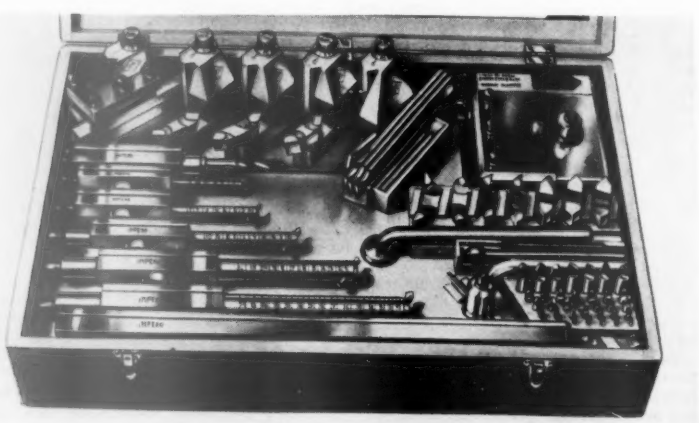
New Vitreous Fabric

VETRONA is a new glass fibre fabric having several properties which make it suitable for transport use. It is fire-resistant, draughtproof, highly crease-resistant, unshrinkable, unassailable by moth and vermin, does not harbour bacteria, and will not stretch, sag, or rot. It is not cold to the touch.

It can be obtained in white, cream, plain colours, and attractive patterns which are silk-screened during manufacture and consequently indelible. Its light-reflecting and filtering properties make it translucent and suitable for curtains, lampshades, and bedspreads. It is easily laundered in a warm lather of detergent, after which it drip-dries in seven to ten minutes.

Special advantages claimed include absence of "yellowing"; dirt-resistance; selvedges which need no hemming, and sufficient bulk to make lining unnecessary in most cases. All sewing is carried out with mercerised cotton.

The British manufacturer is Vetrona Fabrics Limited, 90, Great Bridgewater Street, Manchester, 1. Price is 20s. to 29s. per 46-in. wide yd. (retail): delivery will be ex-stock early in the new year.



Air Silencer

A compact air silencer designed to fit in the discharge port of a great variety of pneumatic tools and appliances where a high-pitched exhaust air noise is known to cause annoyance and consequent loss of efficiency and production, is available in two sizes—KK4 and KK6. Called the Muffl-Maze, both have male threaded connections from ⅛ in. to ¼ in. B.S.P. and the standard construction is mild steel body and galvanised wire element. Alternative construction can be supplied.

The Muffl-Maze is easily removed for washing in any commercial oil solvent. The prices for the two sizes are 10s. and 14s. 3d. when sold in small numbers.

Further details are available from Air-Maze Limited, Church Street, Warrington, Lancs.

Ministry of Transport Accident Report

Arkleston Junction, May 20, 1958: British Railways, Scottish Region

Colonel W. P. Reed, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at 8.13 a.m. on May 20, 1958, at Arkleston Junction near Paisley, when the 7.15 a.m. passenger train, Gourock to Glasgow, consisting of eight heavily loaded coaches, drawn by a Class "4" 2-6-4 tank engine and running under clear signals, collided almost head on with a "J"-type 0-6-0 tender engine with van which was moving irregularly into its path; the combined speed was about 35 m.p.h. Its first two coaches were telescoped and four compartments in each wrecked. Both engines were extensively damaged. Ninety-seven persons were injured—one fatally—and 26 had to be detained in hospital. The train driver was not seriously injured and his fireman escaped comparatively lightly, although he could not attend Colonel Reed's inquiry. The other driver and fireman had jumped clear without serious hurt but the guard in the van was badly shaken. Emergency calls for assistance were quickly answered and the first ambulance arrived within 11 minutes. The heavy morning passenger traffic was much dislocated but the lines were restored in stages and normal working resumed at 8.20 p.m. It was fine and clear with dry rails. The accompanying diagram shows the lines, signals, points, etc, essential to an understanding of the case.

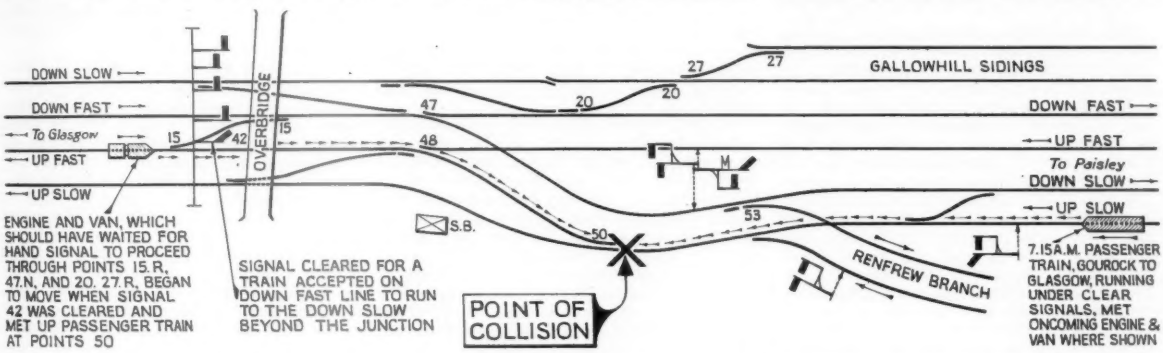

DOWN SLOW
DOWN FAST
To Glasgow
UP FAST
UP SLOW
OVERBRIDGE
15
42
47
48
20
27
27
GALLOWHILL SIDINGS
DOWN FAST
UP FAST
To Paisley
DOWN SLOW
UP SLOW
M
S.B.
50
53
RENFREW BRANCH
ENGINE AND VAN, WHICH SHOULD HAVE WAITED FOR HAND SIGNAL TO PROCEED THROUGH POINTS 15 R, 47 N, AND 20, 27 R, BEGAN TO MOVE WHEN SIGNAL 42 WAS CLEARED AND MET UP PASSENGER TRAIN AT POINTS 50
SIGNAL CLEARED FOR A TRAIN ACCEPTED ON DOWN FAST LINE TO RUN TO THE DOWN SLOW BEYOND THE JUNCTION
POINT OF COLLISION
7.15 A.M. PASSENGER TRAIN, GOUROCK TO GLASGOW, RUNNING UNDER CLEAR SIGNALS, MET ONCOMING ENGINE & VAN WHERE SHOWN

Diagram showing circumstances of accident at Arkleston Junction, near Paisley, British Railways, Scottish Region, May 20, 1958

Layout

At this junction the "parallel" working of fast and slow lines on the east changes to "up and down" on the west, where there is a connection to the Renfrew branch and, on the south, to the Gallowhill sidings to which the engine and van ought to have travelled in due course. On the Glasgow side the lines are in a wide cutting, about 20 ft. deep at the overbridge shown on the diagram; this has a high arch, in no way obscuring the view from the signalbox of the down home signals. There is no difficulty in seeing an engine standing by these signals on the up fast line beyond No. 15 points, as the one concerned in this accident was doing. There is some track circuiting and comprehensive block controls; all signals not in view of the box have arm and light repeaters.

The signalman said that the engine movement from Paisley to Gallowhill sidings was a regular one carried out about three to four times daily. The engine, propelling the van, arrived along the up slow line and was stopped at the home signal for a train to pass on the up fast. He then set the route through points 50 and 48 and the engine came forward under signal and stopped beyond points 15; he restored points 50 and accepted the passenger train and cleared the signals for it to run up slow to up slow; "entering section" was received at 8.12. The engine and van required to travel to the sidings over points 15, 20 and 27, a movement hand signalled from the window by green flag or lamp, but could not do so at once as he had accepted the 8.0 a.m. train from Glasgow to Gourock on the down fast; this required to travel through points 47 and 53 to the down slow towards Paisley. This needed 48 points reversed, but these are not interlocked with No. 50, to afford freedom of movement along the up slow line at the same time. This down train was accepted at 8.11, when "entering section" also was received for it; its route was then set and signal 42 cleared. This signal is located above the up fast line. The engine and van then began to move. The signalman put all signals back to danger on noticing this and waved to the driver but the engine continued to come slowly forward.

The passenger train driver who had passed the up slow home signal before it was thrown back, observed the signalman's urgent gestures and then the approaching engine; he braked immediately and thought his speed then was 30 to 40 m.p.h., which the guard confirmed.

A passed fireman was in charge of the engine and said he had not previously carried out this movement as a driver but had seen it several times as a fireman and knew what to do and that he had to await a hand signal from the box before he could move over 15 points towards the sidings. He could not see the box clearly from his position on left of the footplate; the boiler was partly in the way and he relied on his fireman. He said that after they had waited 2 to 3 min. the fireman said "that's right" and he tried to sound the whistle but it failed to work properly. He noticed that the points were set to take them towards the up slow line and thought the signalman must want the engine back in rear of the home signal—at which they had stopped when coming from Paisley—in order to allow a movement on the up fast. He was looking out expecting a hand signal indicating where he was to stop when, near the box, he saw the train from Gourock coming, applied the brake and shouted to his fireman to jump off, which he also did in time.

This man knew the fireman to be young and inexperienced but took no steps to check on the sort of signal he had seen, nor did he exchange signals with the guard in the van in accordance with rule. His assumption that they were to move to the up slow line was not based on previous experience and he could not remember making such a movement at this place before.

Colonel Reed had no difficulty in seeing the signalbox through the spectacle glass from the left-hand side of such an engine and found the view of the up slow line to be excellent; an approaching train could be seen at about ½ mile, but, questioned on this, the driver reiterated that the view forward was bad and that it was necessary to lean over the steam brake to look out; he could give no other reason for not seeing the passenger train until it was about a coach length away.

The fireman, a passed cleaner, aged 19, did not know the route to the sidings and his knowledge of signals was slight. He said that soon after they stopped a signal came off and he said "right, mate" and then put coal on; the next thing he knew was the driver shouting to him.

The guard in the van said he had only just managed to put the tail lamp in position—a job requiring under half a minute—before they started back. He assumed a hand signal had been given from the box and did not look out; he should have done, under Rule 111 (b) which placed responsibility on him for having such authority before giving the signal to the driver to move, as there was no fixed signal. Although his service is short he apparently knew the kind of signal to expect but his evidence was confused and he seemed slow witted. It was difficult to make him understand that he had a clear responsibility in seeing that a proper signal was given before allowing the driver to proceed to shunt; he insisted that the speed of events had been too much for him.

Colonel Reed questioned the motive power depot inspector on the methods of training firemen and was assured that the rules regarding exchanging hand signals with the guard were fully dealt with in the

mutual improvement classes and ensuing examination questions; he looked out for this point among many others when studying the behaviour of firemen when they were driving. He did not keep a roster to ensure that he travelled with each recently passed fireman in turn; he relied on frequency of his footplate inspections to cover all such men.

Inspecting Officer's Conclusion

The passenger train driver was alert and lost no time in applying the brake and the signalman was in no way to blame. Main responsibility rests clearly on the driver of the engine, who accepted the word of his inexperienced fireman that the signal to proceed had been given and failed to verify that it was the correct one and applied to his engine. He omitted also to ensure that signals were exchanged with the guard and it was clear that such was his habit.

The shunting movement is a somewhat complicated one over four running lines and he should have been all the more meticulous in carrying it out; the fireman, in view of his inexperience, is not blamed for his mistake. The guard should have been looking out for the hand signal from the box; he seemed not to appreciate his responsibilities in this respect and appeared to lack the mental agility necessary to undertake properly a guard's duties.

Recommendations

The movement was in some ways more difficult than one of a passenger or freight train running in accordance with fixed signals. The driver had first to obey the fixed signal, up slow to up fast, and judge his stop clear of 15 points, then carry out a reverse movement under a hand signal given at some 200 yd. distance, in order to cross two running lines towards the sidings. Such movements often are carried out by junior drivers, or passed firemen, assisted by very inexperienced firemen, with junior guards, as they are normally a prelude to shunting work. It is all the more necessary, therefore, that the dual responsibilities of enginemen and guards on these occasions for observing signals should be brought home to junior men, both during teaching and examination and also footplate supervision. It would be advisable to give more weight to this aspect of instruction for firemen and guards, and Colonel Reed suggests that some emphasis might be laid by supervisory staff, when instructing passed firemen, on their responsibilities for setting a good example in correct working to young and inexperienced passed cleaners.

This movement being a frequent one at this place and crossing running lines and beginning at an appreciable distance from the box, Colonel Reed recommends that a fixed signal be provided.

Antofagasta (Chili) & Bolivia Railway

Mr. H. C. Drayton on position

The seventieth annual general meeting of the Antofagasta (Chili) & Bolivia Railway Co. Ltd., was held on December 9 in London.

Mr. H. C. Drayton, Chairman, said: "In the statement circulated with the report and accounts I think you will agree that I have been very forthright in setting out the position of the company as I saw it. There is not a great deal I can add to that statement except to say that since the report was issued we have sent our Managing Director, Mr. R. H. Dobson, out to Bolivia to see the President of Bolivia and put the position of the company before him.

We did not do that because our General Manager had not put the position before him but because we thought it was necessary to strengthen his hand so that the President would understand that we were serious in taking all steps we could to safeguard your interests.

Essentials for Future Working

This company performs a service to Bolivia and has a duty to that country and your Directors and myself would be quite prepared to come before you and say that at certain times when a country was in distress we would play our part in making any sacrifices that had to be made. I would be prepared to come and say that to you today, but before I could say that there are certain principles that have got to be observed. I would not be justified and neither would the Board in saying that to you unless we felt that we had solid ground under our feet whereby the future would look reasonably assured. For that solid ground, we as a Board of Directors and your managements, have got to have control over the running of your property. It has got to be run efficiently and it has got to be run economically without any outside interference. That does not appertain in Bolivia today.

We have a great many surplus employees but under the law of Bolivia, we cannot dispense with their services and, even if we could, we have to pay them compensation. The second principle is that we must be allowed to charge freights which would at least give us an opportunity to make ends meet. Thirdly, we must be relieved of the onerous social obligations which have been laid upon us and which should fall upon the country as a whole.

Without these assurances it is highly improbable that we can see our way to continue to serve Bolivia as we have done in the past. As I said, Mr. Dobson went to Bolivia and saw the President and we hoped that we were getting somewhere, but he has not seen the President since and we have not got any further. It is obvious that we cannot run ourselves into such a position, even if it was impossible for us to continue in Bolivia, where we should not be able to fulfil our duties and obligations in Chile.

The report and accounts were adopted.

Engine Driver Not Guilty of Manslaughter

Driver A. Wembridge, the driver of the locomotive of the southbound car-sleeper train which collided with an electric train in Eastbourne Station, Southern Region, on August 25, was found Not Guilty of unlawfully killing Driver C. D. Brock, the motorman of the electric train, at Sussex Assizes, Lewes, last week.

The guard of the car-sleeper train, stated in evidence that he had never experienced such rain before. Asked what the rain was like after the accident, he said that there was barely a drop then. "When we came under the bridge it was leaving off. It was unbelievable, but that was a fact."

Mr. Gerald Howard, Q.C., for the prosecution, said that Driver Wembridge, because of his "gross negligence," passed a home signal in the danger position, broke through some points set against him, and killed the motorman of the stationary train. Driver Wembridge had said that he saw the Eastbourne distant signal at the "on" position, and at the time his speed was about 30 m.p.h. He started to apply his brakes gradually, to bring the speed down to a safety margin.

Mr. Howard said that Wembridge's alleged statement went on: "As we approached Eastbourne I saw the 'home' signal. At that time it was raining very hard, and I blinked my eyes to enable me to see better. I was pretty certain in my mind that the signal was in the 'off' position when passing it, though I cannot swear to it."

The Judge, Mr. Justice Slade, said that since December, 1956, Driver Wembridge had only once before driven on the line, some four months before the accident. "I do not think he seeks to attempt to dispute that he passed the home signal at danger, but criminal cases are not decided upon admissions.

"The grossest negligence could cause no damage at all, and a slight degree of negligence could cause the gravest damage. It would not be right to visit the consequences of this misfortune upon the person who made the mistake, if that is the correct word, merely because it happened to lead to those deaths."

CHEAP FARES FOR SKI-ING IN SCOTLAND.—Cheap fares for ski-ing in Scotland are being offered by British Railways, London Midland Region, from January 6. Passengers can travel on any Tuesday, Wednesday, or Thursday by any express train from London, Leicester, Birmingham, Manchester, Liverpool, or Carlisle. A voucher issued by the Cairngorms Winter Sports Development Board is necessary to obtain a cheap fare ticket, which is 20 per cent less than ordinary fare.

FLASHING INDICATORS FOR LONDON BUSES.—Work has started on fitting the 7,000 buses and Green Line coaches of London Transport with flashing direction indicators. The design has been evolved by L.T.E. after tests to find a type robust enough for daily use in London traffic conditions. They are 6 in. long with front and rear plastic lenses shaped like blunt arrows. They are fitted on each side just above the driver's cab. The frames are of rubber stiffened by resin loading at the mounting end. An amber flash is given 76 times a min. to the front and rear. The signal is repeated by a double-ended arrow at the rear of the bus over the number plate. The indicators hinge back to protect them from damage and can be folded back against the bus body when the vehicle passes through a washing machine.

Electrically-Operated Train Indicators at Shenfield

Central operation of nine indicators at busy junction and with heavy interchange passenger traffic

One of the platform indicators displaying "next train" departures

A complete system of electrically operated train departure indicators, integrated for a passenger station, has been installed at Shenfield on the Great Eastern Line of British Railways, Eastern Region.

This station provides a good test of efficiency for such a system, as there are a number of platforms, a variety of train services, with a considerable amount of interchange traffic, and two-way working in certain platforms. Besides being a diverging junction for two routes of electric suburban trains it is also a terminating joint for electric services. It is also a stopping place for main-line trains to destinations such as Colchester, Ipswich, Norwich, Yarmouth, Clacton, and Harwich Parkeston Quay.

Any system of indicators needs to be inter-related and the displayed information quickly and easily altered by a minimum of staff, particularly at peak periods. This has been attained by the adoption of Siemens Edison Swan High Speed Indicators throughout the station, all controlled from one central position.

Nine Indicators Centrally Operated

Nine positions have been selected: a main indicator, with departure times, showing next departures from all platforms, is placed so as to face incoming passengers from the ticket hall; the information thereon (with the exception of times) is repeated on two banks of indicators situated overhead in the subway to serve interchange traffic, whilst on each platform there are indicators displaying "next train" departures from that particular platform.

Each indicator consists of a series of vertically banked hexagonal rotating drums, bearing the appropriate station names. These are displayed through a masked panel so that only the name required is visible at one time. The drums are rotated by small built-in motors, controlled by relays and operated by means of a simple code system.

Each combination of stopping places for trains leaving the station is given a two figure number, which when set up on the rotary switched control panel, is held unshown until a "make display" button is depressed. The advantage of this method is that as soon as one display is shown, the next departure can be set up and held in readiness until required.

The indicators and ancillary equipment were supplied by Siemens Edison Swan Limited.

Questions in Parliament

Permitted Investment Programme

Mr. Ernest Davies (East Enfield E.—Lab.) asked the Minister of Transport & Civil Aviation on December 10 if he would now state the permitted capital investment programme for 1959-60 for the B.T.C., and the amount thereof to be allocated to the railway modernisation programme.

Mr. Harold Watkinson, in a written answer: The total of the Commission's investment for 1959 will be rather more than £200 million and the Commission propose to allocate well over £170 million of this to the railways.

Mr. H. R. Gower (Barry—C.) asked the Minister of Transport & Civil Aviation on December 10 if he would state the permitted capital investment programme for the British Transport Commission for 1959-60; and the amounts thereof to be spent on railway modernisation in England, Scotland, and Wales, respectively.

Mr. H. Watkinson, in a written answer: The total of the B.T.C. capital investment for 1959 will be rather more than £200 million, and the Commission proposes to allocate well over £170 million of this to the railways. The modernisation plan is designed to increase the efficiency of the railways according to the demands of traffic, and the Commission's investment programme is made up for Great Britain as a whole and not separately for England, Scotland, and Wales. The Commission places orders for equipment to secure the most favourable quality, delivery, and price, and it would not be practicable to distinguish the amounts likely to be expended in different parts of the country.

Control box for the nine main, subway, and platform indicators

One of the two indicators positioned in the subway used by interchange passengers

Parliamentary Notes

Re-Appraisal of Railway Modernisation Plan

Assessment of changes in traffic and economic developments

Mr. Harold Watkinson, Minister of Transport & Civil Aviation, in the House of Commons on December 11 moved the second reading of the Transport (Borrowing Powers) Bill. This extends the borrowing powers for competent investment of the British Transport Commission by a further £600 to £1,200 million.

He said that it had been reported in some quarters that the £600 million which the Bill authorised was a new sum of money suddenly injected into the economy which was likely to be inflationary in its nature. This additional sum was authorised in 1954 when the Government undertook to back the original modernisation plan. It was the second half of the money then promised.

What the House was examining today was how the greatest engineering triumph of the Victorian age was to be streamlined to fit into the age of the motorcar and the atom. Any industrialised country had to have a railway system, which had to be modern and efficient. The House would no doubt differ about the methods to achieve this, but everyone would want the great attempt to modernise the system to succeed for the sake of those who worked on it and for the sake of the country.

The railways were not given a large share of national investment in the years after the war. In those years Parliament had debated nationalisation, when it should have been discussing modernisation. Those years, from the point of view of modernisation, were utterly and completely wasted.

Growth of Road Transport

In 1951 there were 4,300,000 motor vehicles and 7,800,000 in 1958. That was a measure of the competition which the railways inevitably faced.

The B.T.C. had received from the Government all it could use in investment for this year and next year. Any claim that the Government was not backing to the hilt this plan was not founded on facts. The Government was backing the plan to the hilt, but because of the lateness at which it was started—and there was no imputation of blame—it would be a difficult race to run.

In 1947 there were only 250,000 "C" licences and in 1958 there were well over one million, increasing fast. The railways were thus handicapped by a late start in modernisation and increasing competition on the roads which, in a free economy, should be encouraged and allowed to go on.

Rising Passenger Revenue

On the passenger side the Commission had lived up to its promise and prospectus. Despite competition, passenger receipts were more than holding their own. For example, on the Bradford-Leeds-Harrogate service annual receipts had increased from £23,000 with steam to £116,000 with diesel multiple-unit operation. The Newcastle-Middlesbrough service had turned a deficit of £10,000 in movement costs in 1955 to a surplus of £137,000 in 1958. The first inter-city diesel service between Edinburgh and Glasgow carried 700,000 extra passengers in the first year of operation.

On the freight side the position was different and, quite frankly, difficult. Receipts had been sagging heavily throughout the year. In the first 44 weeks of this year the merchandise traffic was 14 per cent lower than last year, and 10 per cent down on 1956, which was a more comparable year. It was mainly in heavy traffic, coal and steel in particular. The Commission was pressing on with modernisation, but inevitably it was much slower, and their projects took longer to come to fruition. The Green Arrow scheme and the Export Express scheme were both doing well. By the end of the year fitted freight trains would have increased to 35 per cent. of the whole, the number of wagons fitted with continuous brakes would have risen to 270,000; 44,000 containers suitable for door-to-door carriage would be in use; 150 older marshalling yards would be closed, and 27 new yards constructed under the Commission's immediate plans.

Road Competition

There were those who said that the great motor roads programme which the Government were pushing forward must be detrimental to the railways' future. He did not take that view. Could the railways stand the competition of new vehicles on fast roads? He thought they could.

Mr. Watkinson then referred to the speech of Sir Reginald Wilson to the British Institute of Management national conference. He had said:

"Given reasonable conditions, two men in the country can move in one train as much as 25,000 ton-miles of heavy freight every hour. No other technique yet known to us can touch such figures of output for land transport."

Coupled with that, Mr. Watkinson went on, there was the fact that each working day British Railways had to move four million passengers and one million tons of freight. It proved that the country must have an efficient railway system; that competition from the roads was supplementary. The railways took pride that in the recent foggy weeks they had conveyed 2,100 passengers who hoped to travel by air because they were running and the airlines were not.

An agreement had been recently signed between the Commission and the Electricity Generating Board which meant that about 3,000,000-4,000,000 tons of coal traffic would be regained by the railways in the next six to 12 months, and more in succeeding years, so there was a useful attempt to get coal back from road to rail. At the moment the amount of coal carried by the railways was down by no less than 500,000 tons each week. This was a situation which, while it might be temporary, was none the less disastrous for the B.T.C. finances.

Revising Modernisation Plan

From the figures he had given it was obvious that the Government could not let matters rest as they were. It was no criticism of Sir Brian Robertson and his colleagues, nor a falsification of the 1956 prospectus, to say that in the circumstances it was necessary to look at the modernisation plan and its financial implications again to see whether what was being done was right.

He would not have brought the Bill forward without looking again at that plan in the conditions of the next few years. At his request the Commission had already initiated a full, detailed, and urgent review of the whole plan. It would take account of present and likely changes in traffic and try to re-assess the level of activity in the coal industry in particular, because of the development of oil, and the high price of coal, and future developments in atomic power. Those and a great many other matters could not have been foreseen in 1956.

The Commission agreed with the Government requirement that the inquiry should be thorough and detailed. It would have any help that the Government could give. The Commission was already having talks with the National Coal Board and the Iron & Steel Board and with bodies representing their customers, such as the F.B.I., the Association of British Chambers of Commerce, and the National Union of Manufacturers.

Break-even Date

The inquiry would take some months to complete, and he would try to lay the report before the House by the early Spring. It would be a new look at the whole position and a complete revision and reshaping of the 1956 prospectus.

The terms of reference were:—

To take account of the achievements under the modernisation plan up to the end of 1958, and the benefits obtained from it;

to make a detailed re-examination of the future course of the plan, with particular reference to the next five years related to the future size of the railway system needed in view of current economic developments and future expected requirements;

a re-appraisal of the economics of modernisation in the light of the above, and the steps necessary to achieve the earliest possible break-even date based on an actual assessment of future traffic costs and economies.

At present the Commission and the Government had not departed from the target set in the White Paper for the B.T.C. to break even by 1961-62. The Government would have to receive complete economic justification for any change in that date.

Accelerated Changes

The Commission realised that much could be done now without waiting for the reappraisal. They were, with the Government's support, going on immediately with two lines of attack. One was more modernisation on a narrower front, and the other more savings on a much broader front.

On main-line electrification the Commission proposed for the moment to concentrate resources on the L.M.R. line to Manchester and Liverpool, and hoped to accelerate its completion by several years so as to get a quicker return on the capital invested.

There was to be an acceleration in the introduction of diesel locomotives, particularly north of Newcastle to eliminate the use of steam on an area basis as quickly as possible.

The Government had authorised an in-

crease in capital expenditure in 1959 to speed up the process of main-line diesel locomotives. By 1961 nearly 1,100 would be in service. Electrification in process in other areas would not be stopped. There would be a scrapping of obsolete wagons and other measures of modernisation.

Economies

The Commission had promised to make various savings amounting to £20 million, and the auditors he appointed had reported that, in the absence of any unforeseen adverse factors in the last two months of this year, the undertakings given by the Commission would have been substantially fulfilled by the end of 1958.

He had discussed with the chairman of the Commission a target of additional savings for 1959, and had asked him to raise the figure to at least £30 million in a full year. Mr. Watkinson was confident that it could be achieved.

There would be the introduction of diesel traction in the Western Region, a reduction in the wagon fleet, and other measures to effect part of the savings.

There was no intention by the Government or the Commission to undertake any indiscriminate slashing of the labour force or of the work already in hand. If they were to have a prosperous railway system it must employ fewer men but, he hoped, men more skilled and better paid.

Subsidy Rejected

The Commission rejected the notion of a subsidy as firmly as did the Government. It was a corollary of requiring the Commission to put its affairs in order that they should be able to raise its charges when they thought it fair and expedient to do so. Due to the Conservative Government's action on the freight side, the Commission had entire freedom to charge as it thought fit, subject to getting the necessary powers from the Transport Tribunal. It was using these charges to the best effect, subject to the conditions of the market.

Higher Fares

Mr. Watkinson stated that at the moment the Commission had an application before the Transport Tribunal which he thought would be heard next week, dealing with passenger fares. The application was for increased headroom, the purpose being to allow them to have a more flexible fares policy. For example some luxury trains like the new Master Cutler, might well justify a higher fare than standard.

The Commission had thought of seeing if higher fares would keep branch lines going, if the customers would pay. There were still anomalies and sub-standard rates that should be dealt with. If the tribunal gave powers, the Commission wanted to use them sensibly, to sweep away anomalies and get more revenue where they could.

For the sake of those who might be worried about this—and almost every Socialist-controlled local authority opposed fares increases and would no doubt be doing so—the Chairman of the B.T.C. had authorised him to say that the increases they would make must be governed by market considerations. He understood the Commission had no intention of increasing season or ordinary fares effective within the next six months.

Peak-hour Travel

The new London Travel Committee would have to study whether peak-hour travel could be spread and more efficient use made of public transport, encouraged by a fare differential or fare discrimination between the top of the peak and off-peak hours.

The Commission was already studying that problem, notably with regard to offering inducement to travel off peak.

Mr. Watkinson emphasised that neither he nor the Commission approached this problem in a defeatist way. The disciplines he was forced to impose would be a spur to greater effort and a method of achieving more regarding results.

The Commission was being given the right tools for the job. It had a much more efficient structure. The Area Boards with their link with the Commission through their Chairmen, were doing a first-class job. They were getting much nearer to their customers by the decentralisation now going on within the Regions. They were giving for the first time the kind of personal service that most people thought a nationalised industry could never give at all.

This process of decentralisation could go on, and if in the process the trains should occasionally be of different colour, if old loyalties were revived, if closer contacts were achieved, he could see nothing wrong with that. Indeed, he saw in that the only future for the railways on the management side.

Subsidy in Disguise

Mr. Ernest Davies (Enfield E.—Lab.) said the Minister revealed no consciousness that the Government might share the responsibility, or even be largely to blame for the position in which the Commission found themselves today.

It was going to be impossible for the Commission to repay this loan which had now been made to them to meet their deficits, however efficient they were, and however many economies they made.

It would be more politically honest for the Minister and financially more prudent if he admitted that deficit financing on this scale was a disguised subsidy, and as such it would never be possible for the Commission to repay it.

He went on to quote a report in the *Sunday Express* of December 7, that the Conservative back-bench committee on transport were planning to restore the railways to private ownership.

Mr. E. Popplewell (Newcastle-upon-Tyne W.) suggested less nagging of the B.T.C., and urged an early decision by the Guillebaud Committee on the status of railwaymen. There was no keener advocate of modernisation than the railway workers.

Mr. G. Wilson (Truro—C.) said that with a proper pruning of the services, the railways could provide a useful service. While there was every need to build more roads, there was a good future for the railways.

Mr. Scholefield Allen (Crewe—Lab.) hoped that in future the Crewe railway workshops would make as large a contribution to British Railways as they had done in the past, and that they would be allowed to make diesels.

Mr. G. R. Strauss (Vauxhall—Lab.) complained that the Government had blown hot and cold over the Commission's affairs and had interfered frequently and unwisely in matters which the Commission should properly decide for itself. He considered that the achievements of nationalisation were not generally appreciated.

Mr. G. R. H. Nugent, Joint Parliamentary Secretary to the Ministry of Transport & Civil Aviation, said that it was entirely due to Mr. Watkinson as Minister that the modernisation programme was going on at all. The Commission had supplied a good deal of evidence which the Minister and he had given the House to show that their unshaken confidence in the future of the railways was justified, and the House looked confidently to them to turn "our hopes into realities."

The Second Reading was approved without a division, and the Bill referred to Committee.

Contracts and Tenders

Diesel engine contract for Mirrlees, Bickerton & Day Limited

Mirrlees, Bickerton & Day Limited, a member of the Hawker Siddeley Group, has been awarded a contract by the Government of British Columbia, Canada, for four 3,000-h.p. diesel engines to the value of £250,000. The engines will be installed as main propulsion machinery in two new passenger-motorcar ferries. Each ferry will have two Mirrlees "KVSSDM" 16-cylinder type pressure charged engines fitted with after-coolers, of the direct reversing type, each engine rated at 3,000 s.h.p. when running at a speed of 330 r.p.m. giving a total of 6,000 s.h.p. per vessel.

New York City Transit Authority has placed a contract with Berwick A.C.F. for 110 subway cars for replacement on the I.R.T. line. The order is valued at some £4,000,000, and the first will be delivered next June. Delivery will then continue at 20 a month.

The Italian State Railways has placed an order with Breda Electromecannica e Locomotive, Milan, for 15 diesel-electric locomotives to follow two already on order. They will each be powered by a 1,320-h.p. Paxman 12-cylinder Vee type diesel running at 1,000 r.p.m. built by Fabbrica Automobili Isotta Fraschini e Motori Breda at Sarronno under licence from Davey, Paxman & Co. Ltd., Colchester.

British Railways, North Eastern Region, has placed the following contracts:—

Henry Pels & Co. Ltd.: combined high speed shears and nibbler, Darlington Locomotive Works

Johnson & Phillips Limited: electric lighting installation, Normanton North and South Yards

W. Richardson & Co. Ltd.: heating installation in welding shed, Dinsdale Rail Welding Depot

James Ashton & Sons (Dewsbury) Limited: reconstruction of superstructure, Bridge No. 41, Leeds, Wortley South.

British Railways, Scottish Region, has placed the following contracts:—

Laird Bros.: construction of pits, fuel tank foundations, platforms, amenities building, etc., for diesel facilities, Dundee West Motive Power Depot

James Campbell & Son Ltd.: improvements in staff accommodation at

carriage cleansing depot, and Millburn Yard, Inverness

James Miller & Partners Ltd.: renewal of superstructure of overbridge No. 162, Gavinburn, between Kilpatrick and Bowling

Thomas Gebbie & Co. Ltd.: renewal of superstructures of overbridge No. 150, Kilbowie Road, Singer, and overbridge No. 151, Duntocher Road, Dalmuir Park

The Telephone Manufacturing Co. Ltd.: supply and installation of telephone concentrators, telephones and associated apparatus between Hyndland & Helensburgh

James Laidlaw & Sons Ltd.: erection of new power-operated signalbox, Newton.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow :—

From Iran:

24 items of electric switches and plates with necessary accessories for stations along the lines south of Tehran.

The issuing authority is the Iranian State Railways. The tender No. is 92. The closing date is January 20, 1959. Tenderers are required to submit a bank guarantee of $20,000. The Board of Trade reference is ESB/30262/58.

From India:

14 items of signalling equipment.

The issuing authority is the Director General of Supplies & Disposals. The tender No. is WP-2/4446/27/C. Bids should be sent to the Director General of Supplies & Disposals, Shahjahan Road, New Delhi. The closing date is December 30, 1958. The Board of Trade reference is ESB/30715/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

Cia Automotriz & Equipos Industriales, Avenida Roosevelt, Managua, Nicaragua, has advised the British Embassy at Managua that it would be interested in receiving offers of representation from manufacturers of British locomotives. The firm is especially interested in torque converters of 41 in. gauge. There is a possibility of placing a substantial order in the near future. The Managua company, was established in 1944, and imports machinery, industrial and agricultural equipment, motorcars, etc. It is considered to be a suitable connection for United Kingdom firms. Interested manufacturers should write in English to Mr. William Fister of the Nicaraguan firm; prices should, however, be expressed in U.S.$., c.i.f., Nicaraguan port. Responding firms should notify the British Embassy, Consular Section, 208 Avenida Roosevelt, Managua.

Staff and Labour Matters

Country Bus Wage Plea

On December 12, the London busmen's negotiating committee met representatives of the London Transport Executive. The meeting lasted four hours. After it concluded, the negotiating committee was told that its application for an extra 2s. a week for 6,000 drivers and conductors on London Transport's country services would be referred to the Executive.

Notes and News

Seven Platelayers Killed by Train.—Seven platelayers were killed recently by an express of the German Federal Railway near Rottweil, in Baden-Württemberg.

Self-Discharge Wagons with Swinging Covers.—In last week's issue it was stated that the type Ktmm 60 four-wheel hopper wagons for the German Federal Railway had been built by three Western German firms. The firms are Talbot, Waggonfabrik, Aachen; Orenstein-Koppel und Lubecker Maschinenbau A.G., Dortmund; and Westwaggon, Cologne.

Decimal Coinage in South Africa.—No information is yet available as to the steps to be taken by the South African Railways to provide for the introduction of the decimal coinage in the Union of South Africa in 1961. The Government is reported to be considering compensation to owners of coin-operated machines which will have to be converted or replaced. Many machines in stations are understood to be affected.

Euston Carol Concert to be Broadcast.—Staff at Euston, British Railways, London Midland Region, are to sing carols in the Great Hall on December 23, between 6 and 7 p.m., and part of the programme is to be broadcast by the B.B.C. The carols will be introduced by the Rev. Richard Tatlock, Rector of St. Dunstans in the East, and a collection will be made from passengers for toys for children's hospitals in London. Euston Station will be decorated with illuminated Christmas trees, lanterns, seasonal decorations, and a Christmas Crib.

Royal Visit to Bristol.—The accompanying illustration shows the Queen and Prince Philip, Duke of Edinburgh, admiring the decorations at Bristol Temple Meads Station, British Railways, Western Region, during their visit to Bristol on December 5. Also shown are (left to right) Mr. L. Edwards, Divisional Traffic Manager, Bristol; Mr. K. W. C. Grand, General Manager; and Mr. C. W. Powell, Operating Officer, Western Region. The decorations were designed and carried out by the Public Relations & Publicity Department of the Region.

Diploma of Honour Presented to English Steel Corporation Limited.—The diploma of honour which, as reported in our December 5 issue, was awarded to the one-piece cast-steel bogie loaned by English Steel Castings Corporation, Limited, for display on the British Iron & Steel Federation stand at the Brussels exhibition, was formally presented to Mr. C. Muirhead, Director of English Steel Castings Corporation, Limited, by the Belgian Ambassador, Monsieur René van Meerbeke, on December 10.

British Waterways Door-to-Door Container Service to Continent.—British Waterways, North Eastern Division, is introducing a direct container service to the Continent at all-in rates for traders and industrialists in the West Riding, South Yorkshire, and East and West Midlands areas. Containers will be taken to firms' premises in this country for loading, then by road to the nearest British Waterways depot for transport by barge to ships' sides at the Humber ports of Hull or Goole. These ports have linking services with Gothenburg, Karlstadt, Bergen, Oslo, Copenhagen, Amsterdam, Rotterdam, Hamburg, and Antwerp, from all of which the containers will be delivered by road. The containers, of reinforced fibre-glass, specially designed for the service, measure 7 ft. 6 in. × 6 ft. × 6 ft., with a capacity of 270 cu. ft., which enables them to carry up to four tons of cargo. Specimen containers are on display at the British Waterways depots at Leeds, Sheffield, and Nottingham.

Train Derailed by Crane Scoop on the Line.—An express train from Liverpool to Manchester, London Midland Region, British Railways, collided with a crane scoop which had fallen on the line at Urmston, Lancashire, on December 11, derailing five coaches. A local train from

The Queen admiring decorations at Temple Meads Station during her recent visit

Manchester to Wigan collided with some of the derailed coaches a few minutes later. One passenger was killed. It is thought that he stepped out of the express train on to the track and was hit by the approaching slow train. The collision occurred near a railway bridge being constructed over the line as part of the new Stretford by-pass. The crane working on the bridge toppled over and the jib and scoop holding some 8 cwt. of earth fell on to the line.

London Midland Re-naming Ceremony.—On December 12, H.E. Mr. E. O. Asafu-Adjaye, High Commissioner for Ghana, re-named London Midland Region locomotive no. 45610 *Ghana*. Hitherto, the locomotive had carried the name *Gold Coast*. Mr. Asafu-Adjaye expressed his appreciation of this gesture toward Ghana by British Railways, and observed that the ceremony was aptly carried out at Euston, the gateway to London of many thousands of Ghanaians. Mr. David Blee, General Manager of the London Midland Region, who presided, looked forward to the occasion when, at yet another ceremony, the name-plate of locomotive no. 45610 would be transferred to a diesel or an electric unit, which could be regarded as a symbol of British Railways' modernity. After the ceremony, Mr. Asafu-Adjaye fulfilled a long-felt ambition when he drove locomotive no. 45610 along the track for a short distance. On the footplate were Driver George Wright, of Harlesden, and Fireman William Ashcroft, also of Harlesden.

H.E. Mr. E. O. Asafu-Adjaye with Mr. David Blee at the locomotive re-naming ceremony at Euston

Napier Prize Presentations.—On December 11, at Acton Town Hall, D. Napier & Son Ltd. combined its celebration of 150 years of progress with its fourteenth annual presentation of indentures and awards to apprentices. Of this year's total of 348 apprentices of all grades, 19 graduates, 19 students, 18 tecnicians, and 42 trade apprentices completed their training. Courses, including those for the City & Guilds and Higher National Certificate, are being taken at 26 technical colleges by 287 apprentices. This year, Napier apprentices have secured 64 per cent examination success against the national average of 35 per cent. Two Taylor Woodrow prizes have been won (as last year) by Napier apprentices. Addresses were given by Sir Miles Thomas, Chairman of the Governing Body of the Brunel College of Technology, Mr. H. G. Nelson, Managing Director of the English Electric Co. Ltd., and the Mayor of Acton, Alderman C. T. Higgins (see also editorial reference this week).

Sir Miles Thomas speaking at the Napier apprentices presentation on December 11. On the right are Mr. H. G. Nelson and (centre) Mr. J. F. A. Radford, Chief of Personnel & Training, D. Napier & Son Ltd.

British Railways Christmas Travel Arrangements.—British Railways plan to run more than 1,600 additional main-line trains during the Christmas holidays, principally on Christmas Eve and December 28. In England and Wales, there will be a Sunday service, adjusted as necessary, on Christmas Day and Boxing Day, except in the Southern Region where special services will operate. There will also be adjustments to the normal Saturday services on December 27. Services in Scotland will be normal throughout Christmas except for some alteration to suburban trains on Christmas Day. Extra trains, however, will run to and from England. Christmas fare will be served on certain restaurant cars.

More Autumn Visitors to Britain.—The increased flow of overseas visitors to Britain in 1958 continued in October. Figures issued by the British Travel & Holidays Association show that 80,500 visitors arrived in this country during the month, an increase of 15 per cent over the total of 70,000 in October of last year. Visitors from European countries numbered 38,600—17 per cent more than in October, 1957. Increase included visitors from Sweden, 39 per cent; Italy, 32; Portugal, 31; Spain, 25; Switzerland, 22; and Germany, 20 per cent. The October traffic brings the total number of oversea visitors to Britain in the first 10 months of this year to 1,132,000, an increase of 5 per cent over the same period of 1957. The total of 544,600 visitors from Europe represents a decrease of 3 per cent compared with 1957. Traffic from the U.S.A. in the same period increased by 22 per cent.

United Railways of Havana Appeal Dismissed.—The Court of Appeal last week dismissed an appeal by the United Railways of the Havana & Regla Warehouses against Mr. Justice Wynn-Parry's judgment for over £250,000 for a Pennsylvania trustee for certificate holders, who provided capital for the company. In 1954 the company went into voluntary liquidation and the liquidators rejected the trustee's proof of debt. The judge directed that the proof be admitted, holding that

the law of the contract, which was that of Pennsylvania, was the proper law to apply. In 1953 the Cuban Government bought the railway and the company's case was that it was released from liability to certificate holders. Lord Justice Jenkins stated that the basic question was whether, at the commencement of the liquidation, the company was indebted to the trustee for rent of rolling stock, and if the question fell to be determined according to English law it would admit of only one answer. In the circumstances the appeal must be dismissed.

Schoolboys' Own Exhibition.—The Schoolboys' Own Exhibition will be held at Earl's Court, London, from December 27 to January 6. The British Transport Commission stand will feature a working model layout comprising main-line and underground trains, buses, lorries, and docks and canals. There will also be a display of individual models, photographs and colour transparencies depicting various activities of the Commission's undertakings. An enquiry counter will be staffed by travel experts and other representatives of the Commission's services, and a free cinema will screen films made by the British Transport film unit.

Villiers Diamond Jubilee Exhibition.—To celebrate the diamond jubilee of the Villiers Engineering Co. Ltd., an exhibition of Villiers- and JAP-engined machines is to be held in the Royal Horticultural Society's New Hall, Greycoat Place, London, S.W.1, on January 7, 8, and 9, 1959. More than 250 British manufacturers who use Villiers Group engines are contributing exhibits, including hoists, conveyors, winches, pumping sets, lighting and generating sets, air compressors and spray painting equipment, rock drills, sweepers and suction cleaners, trucks and barrows, mechanical loaders, hydraulic compressors, washing and cleaning plant, stone and rail grinders, rail drillers and saws, ballast cleaners, sanders, fans, and driers. There will also be a display of Villiers and JAP engines and sections devoted to the other companies in the Villiers Group. There will be no charge for admission. The exhibition will be open from 10 a.m. to 8 p.m. on January 7 and 8 and from 10 a.m. to 4 p.m. on January 9.

Radio Telephony for Toton Yard.—A radio telephony system will be installed at Toton marshalling yard, London Midland Region, British Railways, within the next few months. There will be two-way radio communication in the up sidings between the hump room and control tower and the two diesel engines engaged in shunting trains over the hump. Instructions being passed over the radio system will be heard at all locations. The installation will not supersede the use of fixed and hand signals, but will be an adjunct to them, used to issue instructions in detail which cannot be conveyed by present conventional means. When the system has been completed, and experience gained, its extension to the down sidings, using a different wave-length, will be considered. The radio equipment on the locomotives will be readily interchangeable, two sets being provided for daily use, and one held as spare. There are 15 diesel locomotives at Toton, any one of which might be used for shunting at the up bank, and provision will be made for any engine to be fitted with a radio telephone set as required at short notice.

Forthcoming Meetings

December 20 (*Sat.*).—Railway Correspondence & Travel Society, South of England Branch, at the Junction Hotel, Eastleigh, Hants, at 6 p.m. Paper on "The London & Southampton Railway," by Mr. K. G. Carr.

December 22 (*Mon.*).—Railway Correspondence & Travel Society, Northampton Branch, at the Liberal Club, Castilian Street, Northampton, at 7.30 p.m. Paper on "More railway travel in colour," illustrated, by Mr. J. B. C. McCann.

December 29 (*Mon.*) and December 30 (*Tue.*).—The Institution of Civil Engineers, Great George Street, Westminster, S.W.1, at 3 p.m. Christmas lectures for boys and girls.

January 1 (*Thu.*).—Model Railway Club, at the Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Talk on "Small electric motors and flexible drives," by Mr. A. H. Paling and Mr. D. Murdoch.

January 3 (*Sat.*).—Stephenson Locomotive Society, North Western area, at the Y.M.C.A., Fargate, Sheffield, at 6.30 p.m. Paper on "Some Great Eastern locomotives," by Mr. W. O. Skeat.

January 3 (*Sat.*).—Stephenson Locomotive Society, Scottish area, at 303, Buchanan Street, Glasgow ,at 2.30 p.m. Film show and display of slides, by Mr. J. M. D. Warren.

Railway Stock Market

There has been a cheerful trend in stock markets with many shares moving to new high levels for the year, though in most sections holiday influences led to further falling off in the volume of business. Sentiment continued to be influenced by the unexpectedly good export trade figures for November, and by other hopeful indications that the slowing down of industrial activity and the increase in unemployment figures will be checked before long. In fact, the rise in industrial shares is largely a reflection of the assumption that trade will expand next year, and that meanwhile the home market should benefit more fully the stimulus of Government measures aimed at increasing production. The prospect of speeding up the railway modernisation programme are among developments which should help next year. This prospect is tending to draw attention to the improved outlook for shares of railway equipment and allied companies, which, as has been pointed out in these notes, are at levels giving higher yields than those on many other groups of shares.

There have been only small movements among foreign rail stocks, though further selling of Antofagasta developed because there seems little likelihood of early improvement in traffics; the ordinary stock was two points down at 12, compared with 14 a week ago, while the preference declined from 29¼ to 26½. Earlier in the year the ordinary was up to 19 and the preference to 37½, which indicates the scope for recovery in the future, but it seems that these stocks will have to be regarded mainly as long-term holdings. Chilean Northern first debentures marked 50, Brazil Railway bonds around 6½, while San Paulo Railway 3s. units were again quoted at 2s., and United Havana second income stock remained at 6½.

In other directions, Mexican Central "A" bearer debentures eased from 74 to 73½. Nyasaland Railways shares have been firm at 12s. 9d. with business up to 13s., attention having been drawn to the fact that the 6 per cent dividend is covered four times on the basis of last year's earnings and that the shares offer a yield of 9¼ per cent. In view of the favourable traffic trend, there are hopes that a further increase in dividend to 7 per cent may be in prospect. In other directions, West of India Portuguese capital stock remained at 77 and the 5 per cent debentures at 68.

Canadian Pacifics, reflecting the better Wall Street trend, was $53¼, compared with $52½ a week ago; the 4 per cent preference stock eased to 55⅜, and the 4 per cent debentures moved fractionally lower at 63½. White Pass shares changed hands around $14½.

Among shares of locomotive builders and engineers, buyers were more in evidence on the improved prospects opened up by the proposed speeding up of the railway modernisation programme at home. Beyer Peacock 5s. shares improved to 8s. 7½d., Charles Roberts 5s. shares have been firmer at 10s. 3d., while Westinghouse Brake were higher at 43s. 3d., which is within 3d. of their best this year. Moreover, North British Locomotive gained 9d. at 15s. 3d. and Birmingham Wagon strengthened to 20s. 3d. while Wagon Repairs 5s. shares firmed up to 10s. 6d.

There was once again considerable activity in British Aluminium, which at 71s., however, did not hold best prices, awaiting the outcome of the rival plans for the company's future, which, however, may not be decided until towards the middle of next month.

OFFICIAL NOTICES

AFTER MANY YEARS . . .

. . . railway experience in India and West Africa, Chief Mechanical Engineer is now free to take up an appointment as London Manager, or to represent the interests of a company where his connections and experience would prove invaluable.—Reply to: BOX 727, *The Railway Gazette*, 33 Tothill Street, London, S.W.1.

JAMAICA OMNIBUS SERVICES. Applications are invited for the position of ASSISTANT TO THE SECRETARY-ACCOUNTANT of Jamaica Omnibus Services Limited, operating town services in Kingston, Jamaica. The Company has a fleet of 170 vehicles, staff of 1,000 and modern headquarters and office premises. The appointment will be for an initial term of three years and, subject to renewal, will continue thereafter on a three-yearly basis. The commencing salary will be dependent upon the qualifications and experience of the successful applicant but will not be less than £1,500 per annum (inclusive of an overseas allowance of £300 per annum). In addition, a rent-free house will be provided for a married man, or an additional allowance of £300 per annum for a single man. Passages will be paid to Jamaica for the successful applicant and family, and three months' home leave will be allowed on completion of three years' service, with paid passages for the Officer and his wife. Candidates should preferably be between 30 and 40 years of age and must possess experience in accounting and administration and must have the ability to supervise and control an office staff of some 50/60 persons. Candidates should give particulars of age, qualifications, experience and present salary, and should indicate the earliest date when they could leave for Jamaica. Married applicants should state the number and ages of children. Applications to the Secretary, The British Electric Traction Co. Ltd., Stratton House, Piccadilly, London, W.1, not later than 5th January, 1959.

VICTORIAN RAILWAYS. Tenders are invited for Design of Circuits and manufacture, supply, delivery, construction, erection and installation of Automatic Block Signalling between Dynon (near Melbourne) and Wodonga, with Centralised Traffic Control. Further particulars from Signal Engineer, North Eastern Standardisation, Railway Administrative Offices, Spencer Street, Melbourne, Victoria, Australia. Tenders must reach Tender Box, Room 191, Railway Offices, Spencer Street, Melbourne, Victoria, Australia, by 11 a.m. on 29th April, 1959. No tender necessarily accepted.